



**SOUTHWEST
SKETCHES
BY J. A. MUNK**

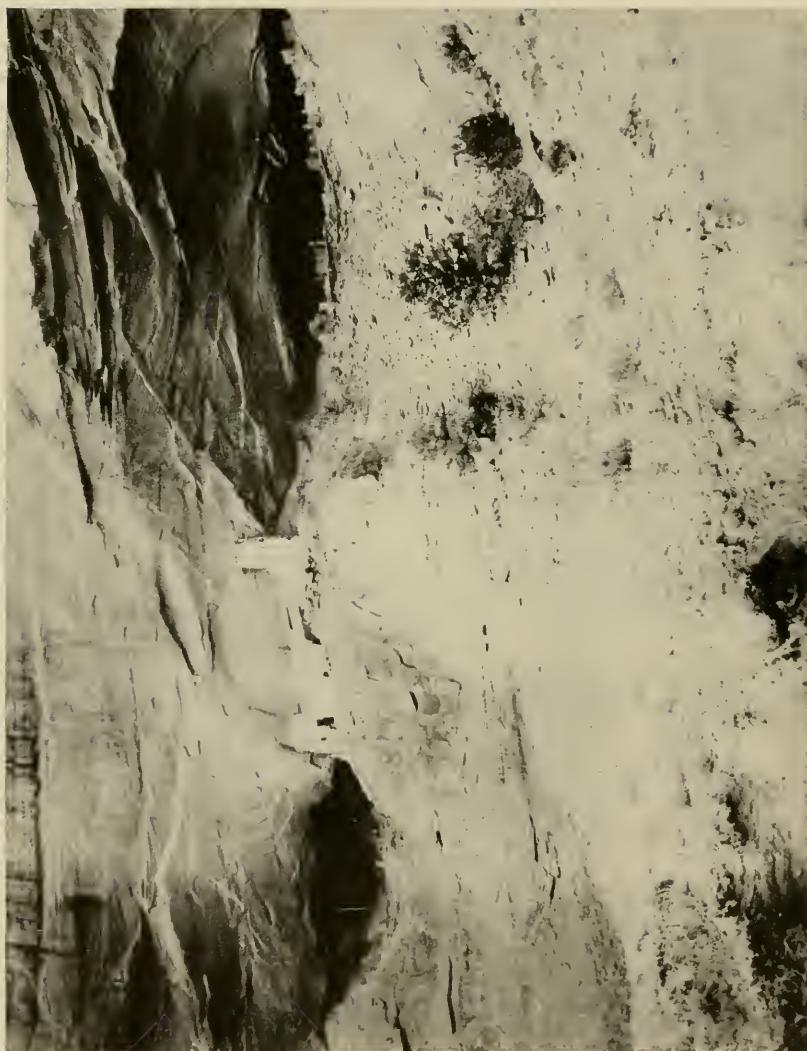


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Mummy House, in Canyon del Muerto, a Branch of Canyon de Chelly

SOUTHWEST SKETCHES

BY

J. A. MUNK

WITH 133 ILLUSTRATIONS

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SOUTHWEST SKETCHES

CHAPTER I

THE MESA COUNTRY

THE mesa country, which includes thousands of square miles of territory in northern Arizona and New Mexico, is a land of rare fascination.

In early geologic times it was lifted from the ocean bed by volcanic action to an elevation of several thousand feet above the sea. Originally, it presented a uniform flat surface between mountain ranges which, in the course of time, became eroded and cut up into mesas, canyons and valleys. Only patches of table-lands of the original plain now remain in evidence and appear at intervals upon the sky line.

Although the region is desert and dry, it has an attraction of its own that lures the visitor and either causes him to stay or else to return again and again. The whole scene, with all that goes with it of earth, air and sky, is deeply impressive and not easily forgotten.

Its unusual features of distance, color and sky line make a striking picture that shows what Nature can do in landscape painting on a large scale, when in her best mood. Such a picture is enough to try the skill of the most finished artist, but it has been successfully

caught and transferred to canvas with brush and pencil many times in recent years.

Near the top of the old time level, as is seen in the fragments of scattered mesas, are buried horizontal strata of rocks that lie under thin deposits of soil. The perpendicular cliffs formed by erosion and marked by an escarpment of rim rock, are, on an average, one hundred feet high, and huge blocks of stone litter the talus below.

The sudden and complete disappearance of boulders at the foot of the mesa, in all such places, is one of the strange and unexplained geologic features of the country. Under ordinary conditions of erosion these rocks should have disintegrated and vanished gradually, but here they disappear suddenly just beyond the talus, and not a single large stone can be found on any of the sunken plains that stretch between the mesas. That the boulders which are found upon the talus were not recently displaced is evidenced by the fact that many of them are decorated with hieroglyphics and pictographs that were made by an ancient people of unknown date, about whom there is no definite knowledge.

In the magical light of the desert the road of endless distance stretches away, like a diminishing stripe of gray, that reaches clear to the horizon. The deceptive atmosphere also helps to measure distance. The nearby hills look natural in their coats of green and brown, the midway mesas are wrapped in a veil of purple haze, while the distant mountains are nearly lost in a dark mantle of blue.

The mountains are massive in their great bulk and represent the strength, silence and patience of the universe. They stand ever steadfast, are always patient



Highland Park from Southwest Museum Hill



Foothills of the San Fernando Valley

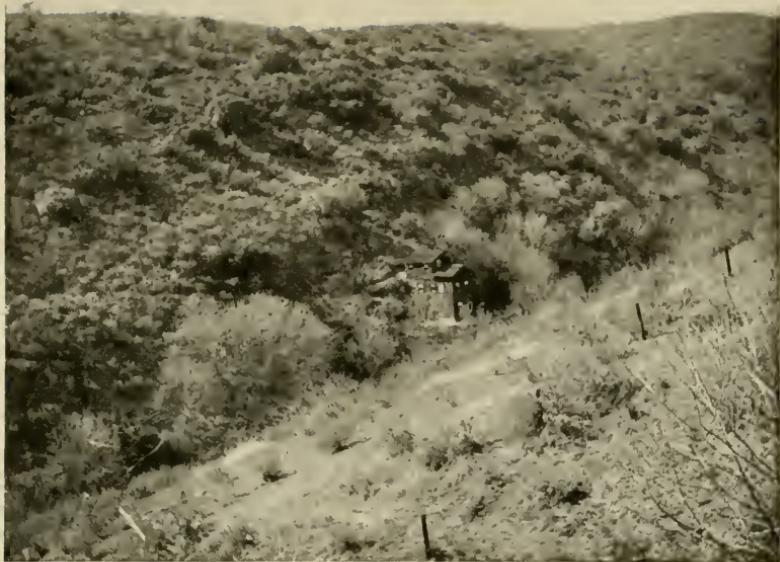
and wait uncomplainingly on the slow but sure action of the leveling forces of time. Everything is just as Nature made it, except along the railroad where the pure air of heaven is sometimes polluted by thick clouds of black smoke which is belched from the stack of a speeding engine. No wonder that the Indian, when he saw the first train of cars rushing across the landscape, believed that it was a new enemy hot upon his trail, ready to consume him alive with one blast of its fiery breath. Such a conception was perfectly natural to his untutored mind, and not far from the truth, as he is, figuratively speaking, being rapidly crowded off the earth by our modern civilization.

Many natural monuments, composed of solid rock, are found scattered over the mesa country. Some of them are carved out of soft, sedimentary rock from sandstone cliffs, while others projecting out of the earth, are of volcanic origin and are as hard as flint. Many of these singular objects are conspicuous landmarks, and make a striking appearance. They stand both singly and in groups, and always can be seen somewhere on the landscape. They stand upright in shafts, pillars and columns, round topped, serrated and flat, in a variety of colors, but are usually either red or black, according to their origin of sandstone or lava.

The most convenient group to reach are the Hopi Buttes, half way between Winslow, Arizona, on the Santa Fe Railroad, and the Hopi villages. A second group of red sandstone columns stands in Monument Canyon, a branch of Canyon de Chelly, thirty-five miles north of Fort Defiance. But the largest and most imposing cluster of buttes in the entire aggregation is in the Monument Valley near the San Juan River, on the Utah-Arizona border. This is a singu-

larly wild and mysterious region that has only recently been described. There are no white people living in the valley, and the few Indians who make it their home find a precarious existence. It is in the vicinity of the Navajo Mountain and the country is yet so primitive that there are no made roads and traveling has to be done by pack animals over difficult trails. The chief of these monuments is named Agathla, or El Capitan, as it is sometimes called, which towers twelve hundred and twenty-five feet into the air. It stands just back of Comb Ridge, another interesting geologic feature, and only its top is visible when approached from the east, which is the usual route of travel. It is distinctly outlined on the sky, and in the clear atmosphere of the desert is seen at a distance of fully one hundred miles. Other familiar objects found in different sections of the mesa country are Mitten Butte, Thumb Butte, the Hay Stacks, Black Rock, Ship Rock, Church Rock, etc.

Much of the rock sculpture is of a massive character and can be seen at a great distance over the level plain. Perhaps as good a specimen of rock carving as can be found anywhere, is the castellated butte of Round Rock, in the Chinle Valley, below the mouth of Canyon de Chelly. As first seen in the far distance, while traveling towards the canyon from the south, it has the appearance of a large castle or city that is resplendent in colors, and looks grandly realistic as the beholder gazes in wonder and amazement at the strange sight of such a magnificent building standing in the midst of a barren desert. The object is constantly visible from the trail during three days' travel, and although its appearance changes frequently, it never seems to come any nearer. Its striking appear-



A Foothill Ravine



Elder Bloom

ance is not wholly due to its shape, but all of its lines are intensified and magnified by the phantasmagoric state of the atmosphere.

When the Spaniards under Coronado first explored the land in search of the fabled seven cities of Cibola, it is not surprising that they should have been deceived by the architectural appearance of this and many other kindred rocks into believing that they were approaching some large house or city. Naturally, after wandering on the desert during many weary months, they were eager to reach some human habitation where they could find needed rest and refreshment, and when they saw these objects, believed that they had reached their goal. The cities, of which they were in search, were reputed to be of great wealth and splendor, but were only a myth, as they did not exist and, of course, were never found, so Coronado with his army of adventurers returned home empty handed and disappointed. Knowing now, as we do, the true facts in the case, it does not seem strange that these people should have been deceived by such unusual looking rocks, when even at the present day, the inexperienced traveler on the desert is deceived in like manner by the same objects which they saw, and for similar reasons.

Owing to its desert character and the sparsely settled state of the country, towns are few and business enterprises limited. The principal occupation is that of stock raising, which includes sheep, horses and cattle. It is yet an unfenced, open range country, where the cattle from the various ranches mingle in wild herds and roam unrestrained over the land. Because of the scanty feed and scarcity of water the ranches are large and the houses far apart. The en-

tire acreage consists of one vast pasture, with boundaries that extend to the horizon in every direction. It is the land of the cowboy and roundup, and has a distinct life of its own. Ranch life on the desert is one of the attractions of the mesa country and is, of itself, well worth going to see.

It is the home of several interesting tribes of Indians, the Hopis, Navajos and Apaches, of whom mention is made in subsequent chapters. They still live in their own country, which has been their home from time immemorial, but their activities are now confined to reservations that are under government supervision.

The Painted Desert is also in the mesa country and is likewise a region of much interest. It is bisected by the Little Colorado River and is approximately two hundred miles long by one hundred miles wide, extending from the Grand Canyon in a southeast direction. Its surface consists of a succession of table-lands and sunken plains that are composed of highly colored rocks and soils, which give the landscape its peculiar gorgeous appearance. The petrified woods are found in this region, and the Black Forest is particularly noted for its brilliant colors.

The average elevation of the country is six thousand feet above the sea and it has unusually attractive scenery. The land is sparsely settled, and, from natural causes, must always remain wild. Its broad open spaces give a feeling of freedom that is unknown in a thickly settled community. Although in the tropics, its high altitude gives to the atmosphere a delicious tang of coolness that makes it an ideal summer climate. The air is clear and sparkling and presents shades of light and color that are rarely seen else-



Early Spring Freshet



Rural Driveway

where. A veil of purple haze covers the landscape, and imparts a velvety softness to the scene, that is enchanting. A calm is also in the air and deep silence prevails; yet many faint sounds fall softly upon the listening ear. The whole world seems to be asleep and in a pleasant dream.

The pure, dry air lends itself readily to the startling effects of the mirage, when the vision becomes mystified and all objects appear exaggerated and distorted. In the field of vision covered by the mirage, things look unnatural and appear to be elevated and elongated perpendicularly, so that the grass is converted into trees, and the hills are enlarged into mountains. It is not clear just how the mirage is produced, or in what manner it is related to optics. It occurs most frequently during the summer months, in hot weather, when the sky is cloudless and the atmosphere tremulous with heat waves. There must also be the right elevation and angle of vision to produce this peculiar effect upon the sight. Suddenly the landscape is changed in appearance, and instead of dry land and scant vegetation, there appears a perfect picture of a lake of clear water, surrounded by a forest of shade trees that look refreshingly cool and inviting in the midst of the hot, dry desert. All nearby objects are distinctly reflected in the water, and it all looks so natural and real that it is difficult to believe that what the eyes see is only an ocular illusion. In the quivering atmosphere and dazzling light, fixed objects appear to be in motion, or seem to float upon the water "like ships that sail the ocean blue."

Upon the dry playa or alkali flat in the Sulphur Spring Valley, between Willcox and Cochise, on the Southern Pacific Railroad, in Arizona, a perfect mirage

lake can be seen almost any day in the year. Travelers upon the desert, where such phenomena occur most frequently, and where water is always scarce, are completely deceived by its appearance, and have been lured to their death by following such a fleeting phantom, in an effort to find water with which to quench their burning thirst. The mirage is witnessed in various phases, but the water scene is its most common form and is, also, the most fatally deceptive. That the features observed in a mirage are very real and not hypnotic, as has been suggested, is clearly demonstrated by the camera.

Royal purple is the prevailing color of the desert and every object in sight is tinged with a violet hue. Distance deepens the effect and the mesas and mountains are daily draped in varying shades of purple haze. Of all the nearby objects the sage brush shows this effect most vividly. The plant is often spoken of as the purple sage, as if purple were its natural color, which is not the case as it is a neutral gray-green. The purple color is not in the plant but in the atmosphere which surrounds it. Every stalk of sage and of every other desert shrub is enveloped in a mist of amethyst, as if it were a generator of violet rays. This effect is not equally distinct at all times, as it is influenced by locality, sunlight and atmosphere, and is only another form of mirage. Several years ago Lungren, the artist, painted a picture of the desert, that was reproduced in colors in the *Outing Magazine*, which presented this quality of desert coloration to perfection.

The name of a recent book written by Zane Grey, entitled "Riders of the Purple Sage," has no clear meaning to the uninitiated reader, but is very signifi-



Young Grove of Eastern Forest Trees in the Munk Arboretum for Testing Foreign Trees and Plants



A California Booster

cant to those who are familiar with ranch life on the desert, and accustomed to horseback riding and herding cattle in the chapparal upon the open range. The brilliant colors of the desert are unknown to the average mortal, as only comparatively few people in the world's population have ever seen a real desert, or know what it means.

A desert can only occur in a droughty land and the arid region of our great southwest is such a country. Upon the desert there are much sunshine, few clouds and little rain. During long weeks and months of dry weather, there is scarcely a cloud to be seen in the sky, or a drop of rain falls to the ground. Small showers falling from thin, horsetail clouds, are occasionally seen streaking the sky, but the air is so dry that the raindrops all evaporate and vanish before reaching the earth. However, there are times during the short rainy season when both clouds and rain are abundant.

To the anxious farmer whose fields need rain, the sky, during a drought, looks like brass, but to the eye of an appreciative artist, it fairly beams with beauty. A magic spell is in the air, and the deep, blue vault of heaven seems filled with a soft mesh of fine gossamer web in a state of evolution. It is a brilliant sight but owing to the dazzling light of a tropic sun, should be viewed only with shaded eyes. After sunset a pink radiance steals over the eastern sky that is said to be the reflection of the desert, and is called the desert glow. It soon vanishes and is followed by the earth's shadow, in the shape of an immense dark arch spanning the eastern sky, that quickly fades in the twilight and is soon lost in the night.

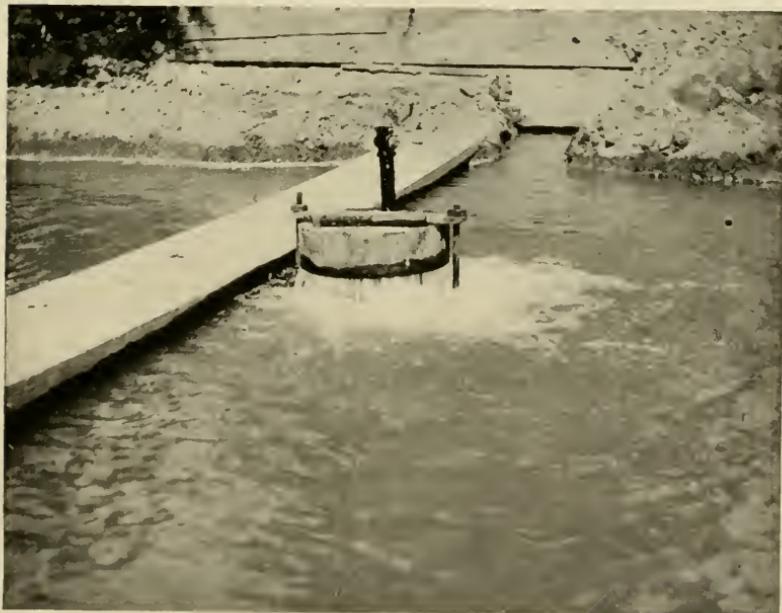
When clouds form out of season they are apt to

bring wind instead of rain, which sometimes develops into a disagreeable sandstorm. Its effects are unpleasant for the time being, but the wind acts as a purifying agent, and after the storm has passed and the dust settled, the air smells unusually fresh and sweet. Little whirlwinds, called dust devils, which travel contrary to the sun, are frequently met in calm weather, but they never do any harm.

After long waiting, but in due time, clouds begin to show in the sky with the advent of the summer rainy season, which happens during the months of July and August. Now, almost daily, cumulus clouds appear in great numbers and float lazily, in billowy masses across the sky. Except during a general rain storm that may last several days, but which does not happen frequently, the sky is invariably clear in the early morning, which is a good time for taking kodak pictures. There is also very little wind during the forenoon, but in the afternoon there is always more or less breeze. After the clouds begin to form, seeming to come from nowhere out of space, they multiply rapidly and soon cover the sky. They act very much as if obeying some unseen commander by falling into line, like platoons of soldiers on parade executing some military evolution. When the aerial army is fully assembled, it moves steadily forward in serried ranks and battle array, as if to meet an advancing foe. The columns of clouds converge and merge into a black nimbus cloud, when the battle begins. Bright streaks of lightning flash across the dark sky, and deep peals of thunder reverberate through the heavens that make the welkin ring. When the rain begins to fall, the patter of the first raindrops sounds like the scattering shots from the skirmish line in a real battle, but soon



Laguna Canal



Artesian Well

develops into the sustained roar of musketry and booming of artillery, when the rain pours down in torrents. The rain sometimes falls in solid sheets of water, which is called a cloudburst and sweeps away everything in its path, often causing much damage.

There is usually a succession of fitful showers during the afternoon and evening, until tired nature, like a weary child, exhausted and tearful, sobs itself to sleep.

CHAPTER II

LAND OF THE CLIFF DWELLERS

THE land of the Cliff Dwellers embraces a wide scope of country, and includes much of the territory that is watered by the Colorado, Gila and San Juan rivers and their tributaries. The region takes in most of Arizona and portions of Colorado, Utah and New Mexico. These four states join one another at right angles and form a junction that is called the Four Corners, and is the only occurrence of its kind in the United States. At this point the San Juan River cuts through three states for a short distance. The country is yet a primitive wilderness and practically unexplored. A unique feature of the region is the Navajo Mountain, which is a large dome-shaped mound standing alone, that affords an unobstructed view from its summit of a vast wild country extending in every direction to the limit of vision. It is the sacred mountain of the Navajos, who are reluctant to have a white man visit it. It has recently been dedicated as a national park, but is too far out of the way to attract many visitors.

Professor H. E. Gregory, in his book on "The Navajo Country," gives for the first time a full and accurate description of that strange but interesting land. He says: "The north-western part of the Western Navajo Reservation beyond the farthest outpost is singularly inaccessible. The roads leading from New Mex-



Yuma



Yuma Ferry

100
100

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100

ico and Arizona settlements to chief points within the reservation, though rough, are feasible for wagons. Roads have also been established along selected routes to reach newly established schools, trading posts and important centers of Indian population. The larger part of the reservation is, however, accessible only by trails and in the rougher areas no recognized routes of travel are to be found. Saddle horses and pack trains capable of making long day marches are necessary for the prosecution of geographic and geologic field work. To those unaccustomed to desert land the Navajo country presents in form and color and grouping of topographic features, a surprising and fascinating variety; those familiar with arid regions will find here erosion features of unusual grandeur and beauty."

The best route for reaching the cliff dwellers' country is from Gallup, New Mexico, on the Santa Fé Railway. Some freighting is done by wagon between Gallup and Kayenta, but the road is not much traveled. Owing to the frequent doubling back and wide detours that have to be made in order to avoid rough ground and impassable arroyos, the distance by the wagon road is much greater than by an air line. What little road there is, is local and found only in spots where it has been made by some lone rancher or trader, and is apt to lead the traveler astray. There is never a good road, seldom a best one and most of the way no road at all. The traveler has to find his way by following in the direction that he wishes to go, the appearance of the country and his natural instinct. Kayenta, at the farther end of the road, is a frontier settlement of the old type, consisting of a single white family, a few Navajo hogans, a trading store and post office.

It is one of the last settlements established on the western frontier, and is perhaps the farthest removed from the railroad of any town in the United States.

Gallup is the best starting point for a trip into the cliff dwellers' country, as the road follows a string of trading posts, but is without a single hotel upon the entire route. The traveler who enters this region must depend on himself and provide his own outfit in advance, or else make arrangements with some Indian trader to take him through.

The first stopping place is Saint Michael's, Arizona, where the Franciscan Fathers have a mission and Indian school. They have been established for many years and are doing a good work for the Indians. They are making a thorough study of the Navajos and have published a complete vocabulary and dictionary of the Navajo language.

Here also lives S. E. Day, an early pioneer and civil engineer, who was a member of the Wheeler surveying party that explored the country west of the one hundredth meridian during the seventies. After this work was finished he decided to make the wilderness his home, instead of returning to civilization. He lived for many years at Chinle in Canyon de Chelly, where he gathered much valuable cliff dwelling material for the museums. Only recently he moved his family to Saint Michael's where he conducts a trading store and lives in peace and comfort.

Ganado, Arizona, sixty miles northwest of Gallup, is the next stopping place and is the home of Hon. J. L. Hubbell, who has lived all his life on the frontier and is everybody's friend. He leads the quiet life of a patriarch in the midst of his family and possessions, and employs a large retinue of servants to do his bid-



Site of Old Fort Yuma, now an Indian School



The Tuba Desert

ding. Hubbell's is the only stopping place in a radius of many miles and is a favorite resort for travelers, scientists and artists who visit the Indian country to study and paint the desert.

Chinle, at the mouth of Canyon de Chelly and in the heart of the Navajo country, is fifty miles north of Ganado. At this place is a government Indian school and the Franciscan Fathers have a branch mission. It is a typical region of cliff dwelling abodes, and has many interesting ruins. A peculiar feature of the place is that in the stillness of the canyon, voices are sometimes heard of people talking who are not seen, which makes the place seem bewitched and uncanny. The phenomenon is due to a peculiarity of the canyon, which has many angles that cause sounds to ricochet from cliff to cliff in a series of faint echoes which travel quite a distance before they completely die away. It is easy to fancy these shifting sounds to be the spirit voices of the departed dead lingering in the old haunts, as if to guard their cherished homes from desecration by curious strangers.

The next and last station on the long road of nearly two hundred miles is Kayenta, the home of the Wetherills. The Wetherill name has been familiar on the frontier for many years because of the activities in settlement work of a family of brothers by that name, who discovered the large cliff ruins on the Mesa Verde and in Laguna Canyon. John Wetherill, the youngest brother, is in charge of affairs at Kayenta and is known as a warm friend of the Indian. His wife, also, is accustomed to frontier life and speaks the local language as fluently as a Navajo. She has improved her opportunity by gathering at first hand a rich store of Indian lore that is valuable to science; and she is

frequently called to act as peace maker in settling disputes among the natives. By her knowledge of Indian character and skillful diplomacy, she has succeeded in collecting a full set of drawings made on paper by a native artist of the wonderful sand paintings of the Navajos, which was not an easy thing to do as they never permit any of the paintings to be copied or carried away by a stranger. In their original form, these pictures are drawn upon smooth ground by touches of many kinds of colored sand sprinkled upon the earth by a practiced hand, and are truly marvelous creations. Each picture tells a different story and is only reproduced for some special purpose in the presence and for the benefit of the elect. The drawing lasts but a day, when with a certain ritual it is obliterated, and the sand carried in blankets to a distant spot where it is deposited.

The trail from Chinle to Marsh Pass, twenty-five miles beyond Kayenta, skirts the Black Mesa for a distance of one hundred miles. The edge of the mesa is a sheer cliff of from twelve hundred to two thousand feet high and presents a great variety of colors and erosion features that never lose their interest. Until recently Kayenta was even more inaccessible from the southwest than from the southeast, but not long ago the government built a wagon road through Marsh Pass which opened a way from the interior of Arizona to the Four Corners and beyond.

The Navajo Indians are now the principal occupants of the land of the ancient cliff dwellers, where they have held undisputed sway for many centuries. They are yet a numerous people numbering over thirty thousand souls, and are the largest and last of the wild tribes. They do not live in villages, but move about



A Wayside Camp



Some Comfort in this Camp

from place to place by families, as the mood takes them. They are a pastoral people owning many horses, sheep and cattle, which graze upon the open range; but also grow some corn, fruit and vegetables. In summer they live under brush shelters and in winter live in rude houses called hogans. When they move, if possible they select a spot where there is plenty of grass, wood and water; but water is always the paramount consideration.

The Navajo is a fine type of Indian and makes a picturesque appearance. He is tall, straight and slender, has strong regular features, and is dignified and reserved in manner. His native costume consists of a colored tunie and a pair of white cotton trousers. He wears moccasins for shoes and ties his long, black hair in a knot on the back of his head. Many of the men are skilled silversmiths and the women are famous blanket weavers.

Indians have their peculiarities the same as white folks. Although habitually stoical and silent, they are sometimes caught unawares and lose their reserve. I noticed on several occasions that when a Navajo woman suddenly meets a stranger, or is surprised from any cause, she invariably raises her hand to her face, touches the finger tips lightly to her chin and utters a faint but audible ah! sound. The Navajo men also have this habit as well as the Hopi men and women.

Like all Indians, they have frequent social gatherings and hold many ceremonial functions, during which there is always much singing and dancing. When they meet on such an occasion they usually make an all night affair of it, and the performance continues uninterrupted to the end of the program. The Fire

Dance is one of their notable ceremonies and is fully described by Dr. Washington Matthews in a government report. Some of the men have fine tenor voices which are trained to sing in a high falsetto key and can be heard distinctly for a great distance in the still night air. A tenor leads the singing until he becomes tired, when another man takes his place and by making changes from time to time, the performance is carried on continuously throughout the night, or it may be during several days and nights, depending on the importance of the occasion.

The Navajos celebrate a summer festival at Ganado in August, following the Hopi snake dance, that lasts three days and nights. The natives gather from every direction on foot, horseback and in wagons, much like an old fashioned gathering of farmers at a county fair. The exercises consist of visiting and gossiping by the crowd, horse and foot races in the afternoon and singing and dancing at night. The variety of bright colors and costumes displayed produces a brilliant effect and is an interesting sight to the visitor.

Many of the white visitors who stay to see the festival, while going to and from the snake dance, are the guests of Mr. Hubbell. At such a time the Hubbell mansion is crowded and those who cannot find a bed in the house have to take a shakedown out of doors. It is a picnic occasion and everybody is disposed to be satisfied with what he gets. Nobody ever goes hungry at Hubbell's. His dining room table seats thirty guests and the chairs are often filled two or three times during a meal. The host is particular that everybody is well fed and has some kind of a bed to sleep on. The novelty of the experience compensates



Oracle, a Health Resort in the Catalina Mountains near Tucson



A Frontier Cabin

for any trifling discomfort that the crowded condition occasions.

Navajo etiquette requires that the son-in-law does not see or speak to the mother-in-law. On one of my visits at Ganado I was present at such a festival. When the crowd began to disperse, my guide to Laguna Canyon asked me to see and bid good-by to his folks who were some distance away in a wagon ready to leave for home. As I had met them I was only too glad to comply with his request and proceeded to execute the mission. He did not accompany me and when I returned he apologized for letting me go alone, saying that he stayed away out of respect to his mother-in-law. The act shows that the Indian has more consideration for his family than some white men.

The Navajo's remedy for all minor ills is the sweat house. It is a small structure resembling a hogan, but is half buried in the ground. It is constructed as nearly airtight as possible and a heavy blanket closes the entrance. Hot stones are placed on the floor in the middle of the room and sprinkled with water. This causes a steam that fills the house and soon produces profuse perspiration. Cold water is then dashed over the patient's body, which is followed by a brisk hand rub. The treatment is said to be both efficacious and popular.

They also have special ceremonies for the severely sick, which are always in charge of a medicine man, who taxes the patient for his services in proportion to his ability to pay. If the patient has money but is reluctant to part with his wealth, or is too poor to pay the price himself, the master of ceremonies informs the patient and friends that relief cannot be obtained until money is paid, which usually brings the desired

answer. The aboriginal doctor's medical and surgical methods are of the most crude and primitive sort, but he is the equal in pretense and conceit to his more highly educated white brother of the regular medical profession. He claims to be able to do everything and nothing stumps him, whether the patient lives or dies. The Navajos are comparatively cleanly and healthy and have regular white teeth, but they have not yet learned the use of the toothbrush. On the border where they are in touch with the whites they are slowly changing by adopting some of the white man's methods; but in the interior where they are yet unspoiled, their habits and customs are much the same as they were one hundred years ago.

The Navajos and Hopis, who live on adjoining reservations, are more fortunate than other Indian tribes, because their home is on the desert, where there is little good land for strangers to covet. The soil is fertile, but without water it is worthless, except for grazing a limited amount of stock. They also live far from the railroads and civilization, which protects them from the introduction of harmful influences and innovations. Before reservations were established there was no demand for public lands in the far west, and afterwards, homesteaders were barred out. Thus the Navajos have been left in possession of a vast domain of nearly ten million acres, covering fifteen thousand square miles of territory in three states, but mostly in Arizona.

Another circumstance in their favor is that they have never received any annuity of money from the government for ceded lands, as they have never disposed of any land. It has always been the case that where any such money was paid to an Indian tribe,



Dos Cabezas Peak



Top of the World

pay day brought in a rough white element that was very injurious to the Indian, not only by robbing him of his cash, but what was much worse, in spreading civilized vice, crime and disease that meant his ruin.

A gem stone of some value, known to the trade as the Arizona garnet, or ruby, is found in many places of the Navajo country. It is usually contained in little piles of gravel which are thrown up by the ants in building their subterranean colonies; but the stones are found in the largest number in the garnet mine on Comb Ridge, in Arizona, near the Utah line. There has never been any effort made to gather these gems extensively, or create a market for them. None of the precious metals have been found in any large quantity on the reservation to tempt a horde of eager prospectors to overrun and loot the land in search of treasure, or to disturb the Indians' peace and quiet. They are permitted to follow their honest occupations as farmers and herders in safety, and have not been corrupted to any extent by vicious strangers.

The Navajos have done much to improve their condition, and even if their growth has been slow, it has been steady and sure. They have never suffered violence to their established customs and what changes have taken place were made of their own volition. They know the value of money and are sharp traders. They borrowed many useful ideas from the Spaniards and their Pueblo neighbors, which have added much to their prosperity.

I made a trip into the far Navajo Country during the month of August, in 1912, and was outfitted by Mr. Hubbell at Ganado with a wagon and team of horses, a saddle horse, guide and a full supply of provisions, cooking utensils and bedding for the trip.

My guide was a Navajo Indian, named Grover Cleveland, who acquired his name while attending school. He was an outrider to find the road which I followed with the team and wagon. He spoke English fluently, was a congenial traveling companion and far better company than some white men with whom I have traveled on other occasions.

Good rains had preceded us and the road was solid, except in places where the storm water had collected in low spots and soaked into the earth. In attempting to cross such a flat we got into trouble. The surface seemed to be dry and hard, but underneath the soil was soft and boggy. Suddenly the horses broke through the crust and sank to their knees in quicksand, and the wagon plunged in after them up to the hubs. After some effort and considerable maneuvering the horses found firm footing and pulled the wagon out of the slough onto dry land when we went on our way rejoicing. Green grass covered the prairie everywhere and water was plentiful. Small rain water lakes were numerous and a good camp ground was found almost any place where we chose to stop.

During the summer rainy season of a normal year, these shallow lakes can be depended on for a supply of water, but at other times water is scarce, as there are but few streams of running water or dug wells in the country, and natural springs are few and far between. The soil is of a reddish color which stained the water to a similar hue, but it was soft and fit for use. Although there was much live stock grazing on the open range and drinking from the pools, yet we never found the water polluted. The sun shone hot during the day but the nights were cool. The weather was fine and we traveled in comfort.



Los Feliz Road



Southwest Museum, Los Angeles

We reached Kayenta in safety, where we left our horses and wagon and changed to saddle horses and pack mules; and, with John Wetherill as guide, made our final dash to Laguna Canyon and its cliff dwellings. We left the wagon road at Marsh Pass, twenty-five miles beyond Kayenta, and with a pack train, took the trail which led into an exceedingly wild and rugged country. The main canyon is winding and has many lateral gorges, all hemmed in by high walls of red sandstone. Its floor is irregular and broken and our progress was slow and confusing as to location and direction. There was scarcely a foot of good road on the trail and we were compelled to pick our way through deep sand and dense brush thickets, and over rocky barriers that were almost impassable. The novice who finds himself alone in this wild region is soon lost, and even those who are familiar with the country sometimes lose themselves.

At Kayenta I was told the story of how Laguna Canyon was formed. Originally the depression consisted of a number of marshy lakes which gave the canyon its name. It is the custom of the Indians living on the plains below to plant their cornfields in the spring and then depend on the summer rains to grow and mature the crop. About thirty years ago there occurred an unusual drought and the cornfields suffered accordingly. One day the owner of a field was heard to say that he wished it would rain. It happened that on the same day he had to go to the canyon to bring home a flock of sheep. While on his way a terrific thunder storm arose and the rain fell in torrents, which washed out the dam that held the lakes, when a flood of water rushed out over the plains and completely destroyed the cornfields. Indian supersti-

tion immediately suggested witchcraft as the cause of the disaster, and fate pointed to the man who made the wish as the guilty culprit. In a few days the man was found dead, killed by his own kinsmen, as they believed that he was a witch. The incident would seem to show that it is never safe for a Navajo to make a wish, particularly if the thing desired goes wrong. The tangible proof of the flood can yet be seen in the deep gullies which drain the canyon and by the dead willow trees that stand on the banks of the dry lakes.

Six miles above the mouth of the canyon is the first large ruin, called Betatakin, or the Hillside House. It stands in an alcove on the façade of a high cliff, and is nearly hidden from view by a dense thicket of brush and forest trees. Several miles farther up the canyon is the largest house in this group of cliff dwellings, its name being Keet Seel, or the House of Broken Pottery. It also stands in a cavern of the canyon wall, but is easily reached by climbing up a long sloping talus. The ruin contains one hundred and forty-eight rooms and is in good state of preservation. Like all the rest of the cliff ruins its age is unknown, but presumably it is many hundred years old. A section of a large pine tree in good condition, measuring thirty-five feet long by two feet thick, and resting on two stone walls about fifty feet above the talus, was evidently used as a foot bridge. The log must have been lifted into place by hand power as there is no evidence of any other kind of force having been used. Over a high, nearly vertical wall close by the ruin are the marks of an old traveled path, that has notches cut into the rock for the use of the hands and feet in climbing up and down the dizzy height, and is known as the Moqui trail. Still farther up the canyon we found other smaller ruins;



Well Fed and Groomed



Cow Ponies

and unexpectedly dropped into the camp of Professor Byron Cummings, of the University of Arizona, who was engaged in directing excavating work and finding many valuable specimens of cliff dwellers' culture.

The three principal groups of cliff dwelling ruins that have been discovered are located in widely separated sections of the country, namely, in Canyon de Chelly and Laguna Canyon in Arizona, and on the Mesa Verde in Colorado. There are small ruins in many other places, but these large ones are the best preserved and are typical of their kind. The cliffs upon which the houses are built are high and perpendicular, and sometimes even overhanging, but are always massive and impressive. The houses are tucked away in shallow caverns from twenty-five to two hundred feet above the ground, in places where they are not readily seen. Some of the houses can be easily reached but others are inaccessible by any natural avenue.

The caves which contain the houses are natural caverns made by weather erosion in the solid rock above the talus. The houses are built out of roughly squared stones laid in adobe mortar, and planned to fit the space of their rocky environments. The floor of the cave is rarely level, often sloping downward and outward. In order to obtain a level floor upon a solid foundation, the outer wall was begun on the sloping rock below and built up to the desired height. The irregular space behind the wall was covered by the floor and used as a store room. There is a great difference in the size of the buildings, ranging all the way from a small house with a single room and only large enough for one family, to a large communal house of one hundred or more rooms, with enough

space to accommodate an entire village. Near every cliff house is always found a permanent spring of good water, and a piece of moist land that is suitable for farming.

The houses are all of similar design and plan of construction, and the location seems to have been selected with a view to its natural beauty, isolation and seclusion. These cliff dwellings are entirely different from the cliff houses found in the Parjarito Park and other places on the Rio Grande in New Mexico, which are of the cavate type, and cut out of soft tufa rock into artificial caves of one or more communicating rooms.

The cliffs are remarkable not only for their size and striking appearance, but likewise for their elaborate decorations. They are frescoed from top to bottom by splashes of bright colors in the rocks and weather stains upon their surface. The walls are extensively carved and sculptured by nature, both in cameo and bas relief, into many kinds of tangible figures that resemble familiar objects. The work has been so well done and produced on such a vast scale that it gives the impression of having been wrought by an extinct race of giant mural artists. The Casa Blanca cliff in Canyon de Chelly is perhaps the best example of such mural decorations that we have.

Who were the Cliff Dwellers? is a question which has often been asked but never satisfactorily answered. Some claim that the ruins are quite modern, which if true, should readily establish their identity. Another opinion is that they were a much persecuted people who fled to the cliffs in self-defense. Such a belief, however, is purely an assumption as it does not conform to the known facts. There is no evidence to show



The Remuda. Horses Heading in to Avoid Being Caught



Cowboys at a Roundup

that these people were ever engaged in any serious battle, and the houses were apparently left fully furnished when their inmates departed. Many better positions for defense and more desirable as homes, according to our view, were available but refused, and only the particular cliff dwelling sites chosen which have been described. They doubtless had enemies the same as other people, but certainly not of the nature nor to the extent that has been claimed. They could easily have resisted any frontal attack, but might have been cut off from their supplies, when they would either have had to surrender or starve. Judging by their critical position they were in much greater danger of dying from broken necks by falling off the cliffs, than from being killed by a hostile enemy. The only plausible theory that seems to fit the facts is, that these locations were selected by deliberate choice, just as all people have chosen their homes in every free country. They must have had artistic tastes and high ideals to build their homes amidst such picturesque and beautiful surroundings. They may not have measured up to our standard, but they at least deserve to receive credit for what culture they possessed.

What Dr. J. W. Fewkes has to say about the cliff dwellings in Laguna Canyon applies also to other cliff houses. "The ancients evidently chose this region for their homes on account of the constant water supply in the creek and the patches of land in the valley that could be cultivated. They may have been harassed by marauders, but it must be borne in mind that their enemies did not come in great numbers at any one time. Defense was not the primary motive that led the sedentary people to utilize the caves for shelter.

"Again, the inroads of enemies never led to the

abandonment of these great cliff houses if we can impute valor in any appreciable degree to the inhabitants. Fancy, for instance, the difficulty or rather improbability of a number of nomadic warriors great enough to drive out the population of Kitsiel, making their way up Cataract Canyon and besieging the pueblo. Such an approach would have been impossible. Marauders might have raided the Kitsiel corn fields but they could not have dislodged the inhabitants. Even if they had succeeded in capturing one house but little would have been gained as it was a custom of the Pueblos to keep enough food in store to last more than a year. Only with the utmost difficulty, even with the aid of ropes and ladders, can one now gain access to some of these ruins. How then could marauding parties have entered them if the inhabitants were hostile? The cliff dwellings were constructed partly for defense but mainly for the shelter afforded by the overhanging cliffs and the cause of their desertion was not due so much to predatory enemies as failure of crops or disappearance of the water supply."

The Mission Fathers have diligently sought to gain some knowledge of the cliff dwellers from the old men among the Navajos, who are the custodians of their tribal legends, and have occupied the cliff dwellers' country for ages, but without success, as they all claim that they have no information on the subject. The early Spanish explorers, nearly four hundred years ago, found the ruins in much the same state in which they exist today, and there is seemingly no means of knowing just how old they really are.

There is a strong presumption, however, that the Hopis are descendants of the cliff dwellers as they



Branding Cattle



Cowboys' Bedroom

have many characteristics in common. Although the Hopis do not live in caves, they nevertheless live an isolated and separate life from the rest of the world and do not incline to mix with strangers. They live by themselves in stone houses upon high rocky mesas much the same as did the cliff dwellers in their caves on the cliffs, and are satisfied and contented with their lot and the life of their forefathers. Many inducements have been made to cause them to forsake their homes on the mesas and live in modern houses built by the government in the valleys below, but without success; and the cliff dwellers must have felt the same attachment for their ancient homes that the Moquis feel for theirs at the present time.

CHAPTER III

IN HOPILAND

ON account of their many good qualities, the Hopi Indians of Arizona deserve to be called the Best People on Earth. The appellation, however, must not be applied too literally as they are only a primitive and uneducated people; yet they easily measure well above the average of human goodness.

They are sometimes called Moqui, but their right name is Hopi. Although few in number, being less than two thousand all told and steadily diminishing, they have attracted wide attention and been written about more than any other aborigines.

Hopiland is in the ancient Province of Tusayan on the Painted Desert of the mesa country in Arizona. Here these strange people have lived for centuries, and have successfully resisted all attempts to move them or drive them away. The region received its name of Painted Desert from the many bright colors seen on the landscape, and its irregular surface of mesa, plain, cliff and canyon shows its diversity of colors to good advantage. Nearly every kind of color is seen somewhere and the harmonious blending of its tints makes a fascinating picture.

The Hopis live in stone houses in nine villages on three high rocky mesas that are extensions southward from the Black Mesa. The first two mesas have each three villages and the third mesa two. Counting from



Desert Vegetation



Sahuara and Cholla Cactus

the east, they are designated as First, Second and Third, or East, Middle and West mesas. Upon the first or eastern mesa are located the three towns of Hano (also called Tewa), Sichomovi and Walpi; upon the second or middle mesa are the three pueblos of Mishongnovi, Shipaulovi and Shongopovi; and upon the third or western mesa are the two villages of Oraibi and Hotevila. Moencopi, the last but one of the oldest of the Hopi villages, stands alone and aloof from the rest and is little known.

The Hopi towns are from seventy to one hundred miles north of the Santa Fé Railway, according to the difference in terminals and the road traveled. The distance from the first to the second mesa is ten miles, and from the second to the third mesa twenty miles. Moencopi is fifty miles northwest of Oraibi and ninety miles north of Flagstaff, near Tuba on the old Mormon road to Utah.

In nearly every description of the Hopi villages only the first seven towns are mentioned, possibly because that number corresponds with the seven cities of Cibola which, in the early days, they were supposed to represent, or else Moencopi was so far distant that it was either lost or forgotten in a casual enumeration. Although Moencopi is but little known and seldom visited by strangers, because of its picturesque location, ample water supply and importance as a farming center, it is of unusual interest. Hundreds of acres of fertile land are being cultivated in the Moencopi Wash by Hopis, Navajos and Americans, and the Hopis have again demonstrated their ability as farmers by their excellent work. What I saw of friendly competitive farming between these neighbors on my visit to Moencopi in 1917 was a revelation. As our

driver, who was familiar with local conditions, sententiously remarked, "The Moquis have the others skinned a mile."

All of the three mesas stand out as prominent landmarks, being from five to eight hundred feet above the adjacent plains. They are entirely devoid of vegetation and all kinds of supplies have to be brought in by hand from a distance, and carried up on steep, narrow foot paths, which requires much time and hard labor.

Notwithstanding its desert character, the country is like a fairyland of enchantment. The view is equally pleasing from each one of the mesas and stretches away towards the south over a landscape of surpassing beauty. A wide valley intervenes between the viewpoint and the far off horizon, which is dotted in the summer time by green meadows, cornfields and peach orchards. The majestic San Francisco Mountains loom up in the distance and the nearer mesas and Moqui Buttes help to make an attractive skyline. It is the dream of artists and poets, who make yearly visits to that land of enchantment, to study nature and receive new inspiration.

The dwellers in Tewa, the first village on the first mesa just above the Gap on the trail to Walpi, are different from the rest of the Hopis and speak a different language. They were refugees from the Rio Grande in New Mexico after the Pueblo rebellion of 1680, when they were adopted by the Hopis. In return for this kindness they pledged themselves to defend the Gap to the uttermost against all hostile intruders, and have faithfully kept their promise. The Hopis were the only pueblo people who escaped from that conflict unscathed.

The Hopis are pueblo or village Indians who had a



Wild Horses



A Profitable Industry

civilization long before Columbus discovered America. They are unusually gentle, patient and industrious and, as aborigines, possess qualities that make them a remarkable people. Considering the unfavorable conditions under which they live it is surprising how they manage to maintain themselves. The white man, with all of his boasted superiority, has failed to sustain himself when placed under similar circumstances. Some time ago the government sent a man from the east to teach these people how to farm, but the teacher soon found himself in trouble and had to call on the natives for help. The Hopis are thoroughly familiar with desert conditions, having experimented for centuries with the scant resources at their command; and have found out in the hard school of experience how to make the best use of what little they have and the most of everything.

They are farmers in the true sense of the word, as they get practically all of their living from the soil. Their main dependence is corn, which is their principal field crop; but they also grow a variety of vegetables and some kinds of fruit. Notwithstanding that they live far south it is not a tropic land, as the elevation of one mile above sea level gives them a cool climate and a short growing season in which to mature their crops. The farms are far from their homes and the men have to travel long distances in going to and from their work. They are early risers, hard workers and not easily discouraged. The men and boys sing and whistle as they go back and forth, the perfect embodiment of happiness and contentment.

They plant their corn in loose, sandy soil where even weeds will not grow, and the last place that a white man would select in which to plant anything. A hole

is made in the loose soil with a sharp stick, the seed planted deep with many kernels in a hill and the hills far apart. They do not use horses, or plows and harrows, but do all their farming by hand with crude home made implements. They stir the surface soil frequently with a hoe into a blanket of dust mulch, which prevents evaporation and the rapid loss of moisture from the soil. By their method of dry farming and the help of an occasional shower during the rainy season, they usually succeed in maturing the growing crops.

By hard work and careful management during the years of plenty, they acquire sufficient means to supply their modest needs. Out of their scanty hoard, they hold in reserve a portion of each year's crop against a possible famine, should there be a crop failure from drought, as sometimes happens. They have never asked or received help from any source and have fully demonstrated their ability to take care of themselves, if only their plans are not interfered with or their work interrupted by meddlesome strangers and foolish busy-bodies.

Merely planting the seed and cultivating the soil does not insure a corn crop, but in addition the owner of a field has to be vigilant in guarding it day and night against the attacks of natural enemies, that are ever alert to share the crop from planting to harvest time. Temporary shelters are built of poles and brush in exposed places, where sentinels are posted to drive away any thieving ravens, rabbits or burros, that are always hungry and hunting something to eat.

Old men who are not able to do hard work and sometimes women and children, act as sentinels to guard the fields from pillage. The rabbits are particularly troublesome and ready to nibble the succu-



Roosevelt Dam



Dedication of Roosevelt Dam

lent corn. As an additional protection a strong decoction of native herbs mixed with canine ordure is made and sprinkled on the tender plants with a wisp of rabbit weed, when the rabbits will not touch them. Whether it is the taste of the noxious weeds or the smell of dog in the concoction that produces this effect I did not learn, but it certainly does the work.

When the corn is fully ripe it is gathered in baskets and carried to the house, where the ears are stacked up in ricks like cordwood against the walls of the storeroom and used as needed. It is ground into meal by the women, who sing softly as they grind the shelled corn in their crude handmills of metates and rubbing stones, and the flour is sifted in sieves of home manufacture into various grades of fineness. The corn has many uses, but is mostly ground into meal and mixed with water into a thin batter which is spread by the naked hand on a hot stone or iron plate and baked into piki bread. The process is somewhat of an art that requires expert knowledge and skillful handling to avoid painful burns. When finished the piki bread consists of a stack of thin wafer cakes which resemble the tortillas of the Mexicans and are eaten in like manner.

The peach was introduced by the Spaniards and soon came into general use among the Indians of the Southwest. It is found in all the pueblos and is also extensively cultivated by the Navajos. The peach orchards are planted in sand dunes at the foot of the mesa, where the trees seem to flourish without receiving much care. The trees grow large and produce an abundance of good fruit. The people take a deep interest in the peach harvest and can scarcely wait until the fruit ripens. Some of it is eaten green or only half

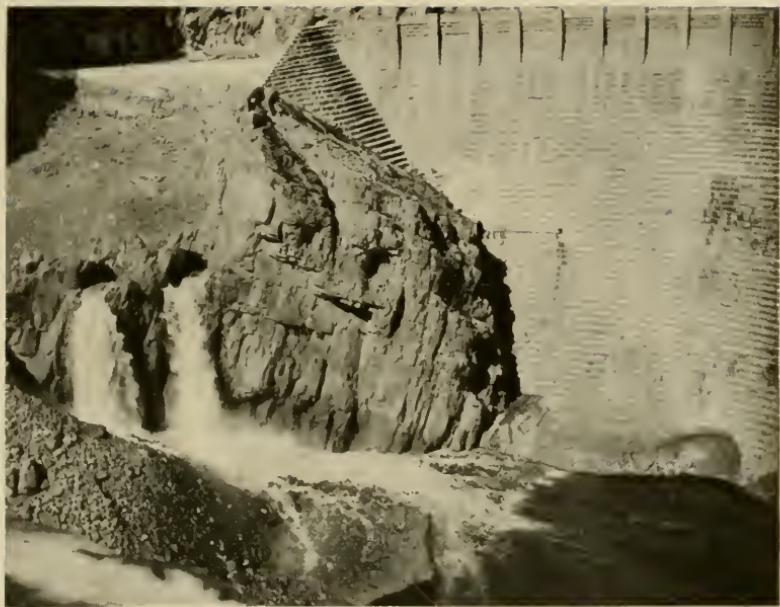
ripe, which sometimes causes sickness, especially among the children. In some years the peach crop is a failure, if killed by the frost, which causes great disappointment in the loss of a much needed food.

The Hopis have always raised cotton and made their own cloth and clothing. With the introduction of the peach came the sheep, and ever since that time both cotton and wool have been used in making their textile goods. In Hopiland the men do the weaving, but among the Navajos it is done by the women. Each village has its own particular handicraft, but spinning and weaving are common industries in all of the pueblos.

Pottery is made principally in Hano, where Nampeyo, the famous woman potter, has a monopoly of the trade. The thick braided basket platters for holding bread and meal are made at Mishongnovi, while the thin Kachina plaques that are used in ceremonies are made in Oraibi. Kachina dolls, tiles and baskets are common objects for gift and barter among the people.

All Indians are close observers of nature and the Hopis are no exception to the rule. They know and study every tree and plant that grows in the vicinity of their homes and find out what it is good for. The same is true of the few wild animals which roam over their country, and nothing is too small or insignificant to escape their notice. Their resources are few, and supplies meager, and they are from necessity compelled to use everything which nature has placed within their reach.

In selecting sites for their homes the Hopis adopted the skyscraper plan of living, by building their houses upon high rocky mesas with perpendicular cliffs, where they have the advantage of elevation and pure



Head Gates



Roosevelt Lake

air, a commanding outlook and freedom from dust and flies. They have no elevators with which to lift themselves up and down, but depend upon the primitive motive power of foot propulsion. Their houses are built of stone on the communal plan, but each family lives in its own separate apartment. The rooms are usually plastered and whitewashed, being kept neat and clean. In former years all kinds of refuse was thrown into the streets, which made them dirty and vile smelling, while the houses were untidy and filled with stale odors. During recent years all of this has been changed and the sanitation much improved. The streets are kept free from litter and the houses smell sweet and clean. Owing to the scarcity of water is it any wonder that these people are not quite as cleanly as they might be?

Dr. Hector Alliot investigated the Hopis several years ago, and reported what he found in a series of interesting articles which appeared in the Los Angeles Examiner. He says: "Without visiting the country it is impossible to realize what water means in the desert of the Southwest. It is the traveler's chief and ever present thought, the all absorbing subject of the sheep herder; to the Hopi it is life itself.

"How many people, if they had to carry a pail of water two miles to their homes, climbing 1,500 feet of rocky trail, would bathe every morning? Certainly not a great number, especially if by doing so they would dangerously lower the supply of drinking water. This condition of affairs the Hopi has had to contend with for centuries. Is it strange then, that cleanliness is an unknown quality among them?"

Although general bathing is not practiced, baths are used on particular occasions. On the morning of the

snake dance everybody is expected to take the ceremonial bath of water and yucca soapsuds for its cleansing efficiency both physical and moral. At the same time the head is shampooed, when the woody fibers of the yucca root get mixed with the black hair, which gives it a gray appearance after it becomes dry. The child receives its bath while sitting in its mother's lap and the shampooing is done vigorously with both hands. The bath not only makes the child clean for the time being but its effects are supposed to last for an indefinite period.

The Hopis observe woman's rights in an original and practical manner. The wife owns the house and controls the home. She also decides the family name and pedigree. Marriage is by mutual consent, but the woman proposes and not the man. When a girl wants to marry she "pops the question" by offering some little gift to the man she loves, on some ceremonial occasion, preferably during the foot race which precedes the snake dance.

When a girl reaches the age of puberty her hair is done up in two large whorls above the ears by her mother or some other female member of the family, as the girl cannot do it herself. This style of coiffure proclaims her to be of marriageable age and in the matrimonial market. It is supposed to resemble a full blown squash blossom and signifies fruitfulness. After she is married, the style of wearing the hair is changed by twisting it into two coils that fall in front of the shoulders, which represent the dried squash blossom and means maternity.

After a couple are married the husband goes to live with his wife instead of the wife with the husband as is our custom. The husband owns the flocks and



On the Apache Trail



Laguna Dam Intake Gate

fields, and only occupies the house by sufferance. If the match proves to be unsatisfactory the wife divorces the husband and there are never any court squabbles. She puts his few personal effects outside the door, and when he returns to the house and finds what has happened, he knows that he has lost his "happy home" and there is no appeal. However, he is still his "mother's boy," and when he is turned out of doors he picks up his traps and goes to his mother's house to live, until some other woman marries him, when he goes to live with his new wife.

The Hopis are a peace loving people and believe in peace at any price. They are contented and happy and only ask to be let alone and not disturbed in their home life. They are friendly to strangers but will resent interference and resist coercion. No vice or crime has ever been known to exist among them and they have no use for courts and jails. There are naturally some disagreements in a Hopi family, or they would not be human; but when any trouble does occur it is seldom seen on the surface, neither do they quarrel or fight. Whenever anything serious threatens, the case is brought before a council of old men who arbitrate the difference, and their decision is accepted by all concerned, and is final.

The parents are very fond of their children, and the sick and feeble are tenderly cared for. The children do not cry and are never rude, but are uniformly respectful and obedient. Compared with most white children they are shining examples of goodness that might be coveted. They are always good natured and kind and as playful as kittens.

The Hopis have an interesting custom of making dolls to represent their Kachinas or deities that are

given to the children to use as playthings. These dolls are also used to teach the children the attributes of their deities, which is a regular system of kindergarten instruction that was in vogue here long before white men adopted it in their schools.

They have many different clans or societies, numerous kivas or lodge rooms, and their ceremonies are multiplied and varied. The white man prides himself on the number of his secret lodges and variety of regalias and rituals. If these things are any evidence of superiority, then the Hopi far excels the Caucasian, as his round of lodge work is almost a continuous performance. Years ago Agent Charles Burton complained that he could not get the Indians to do any work, as they were always busy in their kivas, and had no time for anything that he wanted them to do. There is scarcely a day during the year in which some religious ceremony, dance or festival is not on the docket. Perhaps their most remarkable performance is the ceremony of the winter solstice for stopping and turning back the sun.

If they want anything they believe that they can get it by praying. They attach great value to feathers, which represent their prayers, and are important factors in their daily life. Some of their ceremonies are prolonged and complicated, and are thought to be effective in proportion to the amount of time and effort involved. In the ordinary, every day prayer, the use of one or two small feathers is sufficient to bring a favorable answer. A feather is tied to a stick and placed on some secret shrine or altar, where it remains until an answer is received, while the devotee goes about his daily task. A small prayer in the form of a little fluffy feather tied to a string, is often seen hanging



Leader of the Pack Train



Uncle Sam Hunting Hostile Indians

from the ceiling of a room. They are very careful to always have plenty of feathers on hand for every occasion.

The eagle and turkey are the two varieties of birds that furnish the feathers used. The eagle is their favorite bird and its feathers are prized accordingly. They make a prisoner of every eagle that they can catch, but the bird is now very scarce. Instead of keeping it captive in a cage, they tie it by a cord on one foot and fasten it to the house top. When the eagle feathers are exhausted turkey feathers are used as a substitute.

The native turkeys were once wild, but have been domesticated and are free to run in the streets, glad to pick up any scraps of food they can find. The turkey is considered sacred and its meat and eggs are not eaten, as their religion forbids it. However, they will sell the eggs to visitors if they have a chance, and do not object to strangers eating them. On my first visit to Walpi, in 1901, I recall that Supela, one of their head men, brought turkey eggs to our camp and sold them for twenty-five cents per dozen, which we were glad to buy and considered the price cheap. They also have some chickens, but these are for domestic purposes only, the same as we use them.

The snake dance is the most noted and spectacular of all the Hopi ceremonies. It is a solemn religious rite and an elaborate prayer for rain. In a land of drought water is the supreme consideration, as it is of vital importance to all of the people. The snake dance is designed to help the water problem by causing rain to fall when rain is most needed and, surprising as it may seem, it is invariably followed by copious showers and general rejoicing.

The dance that is advertised occurs once every year

during the month of August, at Walpi in the odd years, and at Oraibi in the even years. The dance is an annual celebration and a public affair to which everybody is invited and to which everybody goes. It is sometimes given in some of the other villages, where the dance is a quiet, home affair and only attended by the home folks. These smaller dances are the most interesting as they are more typical of the ancient rite, and have not yet become modernized by commercialism.

The legend of the snake dance states that a long time ago two brothers had a quarrel, when one of them was turned into a snake. When the other brother realized what had happened, he was deeply grieved and vowed to spend the balance of his life in pacifying his offended brother and his kindred. This legend is said to have been the origin of the Snake Clan and dance, and resulted in the kindly treatment of all members of the snake family. The snakes are considered to be in direct communication with the rain making power, and after the dance they become the messengers to carry the Hopi prayers to the rain god for more rain.

Ceremonies are going on unceasingly during nine days of fasting in the sacred underground kivas and culminate in the final event of the snake dance in the open plaza. In the meantime hunters are sent out to gather snakes, who bring in, from their four days' search, from one to two hundred reptiles of different kinds, but mostly of the rattler variety. The rattle-snake is symbolic of a rainstorm. The spots on its body typify clouds, the forked tongue lightning and the rattles thunder. After the serpents are gathered and carefully washed, they are herded in a corner of the kiva to be in readiness for the snake dance. At



Fort Apache



Road to Fort Apache

five o'clock in the afternoon of the ninth day of the ceremonies, the real snake dance begins in the public plaza and lasts about an hour.

Before the dancing starts the snakes are removed from the kiva to the kisa, an enclosure made of cotton-wood boughs and cloth on one side of the plaza, from which they are handed out to the dancers, one at a time as they pass by. The Antelope priests are the first to leave their kiva, and in paint, feathers and full regalia, file into the plaza and take their places in a row in front of the kisa, facing inwards. They are soon followed in like manner by the Snake priests who number about thirty. These men step out with much vim and vigor in a regular furiosant march of swift, long, strong strides that stop at nothing, and the luckless pedestrian who happens to get in their way is apt to be knocked down and run over.

After circling the plaza a number of times they form a line in front of and facing the Antelope priests. They all now begin singing in unison a most impressive chant to the soft, rhythmic patter of moceasined feet beating time to the music, which is repeated. The Antelope men also keep time with gourd rattles that are held in the hands, while the Snake priests mark time with tortoise shell rattles fastened to the ankles. The feather snake whips are used as batons. Following a brief pause, while the Antelope men remain standing in line, the Snake men break ranks, form into groups of three, and march in front of the kisa. As the trio of dancers approach the kisa, a snake is handed out which a member of the party takes and holds suspended from his mouth, while the real dance begins and continues at a furious pace until all the snakes have been served.

The man who holds the snake in his mouth is called the Carrier. The second man, known as the Hugger, walks by the Carrier's side with his left arm thrown over his shoulders, and with his right hand fans the snake with a feather whip. The third man of the group, called the Gatherer, follows the other two and picks up the snakes after they are dropped. At the close of the dance the snakes are all thrown into a heap inside the mystic circle of sacred meal in the center of the plaza, where they are sprinkled by the women with more of the same kind of meal. Each dancer now reaches down and grasps a handful of the serpents and starts off on a fast run across the mesa and down the trail to the plain below, where he gently drops the snakes one at a time, when they are supposed to go on a journey and carry the message to the rain god for rain. After distributing the snakes the men return to the mesa and take the snake medicine, which acts as an emetic; then their bodies are washed with more of the same fluid by the women. They then retire to their kiva and break their long fast by a feast of good things, which ends the ceremonies. The men who handle the snakes are sometimes bitten by the rattlesnakes but receive no injury, as their antidote, which is applied both internally and externally, makes them immune to the poison. It consists of a decoction made from native herbs, the ingredients of which are only known to the Snake priestess, Saalako.

These men are experts in handling venomous reptiles and seem to have taken lessons from the eagle. When the eagle attacks a rattlesnake he does not swoop down upon it and grab it at once, but waits until he prepares his victim for the slaughter. If the snake is coiled, which indicates its fighting mood, he hovers



Apache Wickiup



Apache Squaw

above it in the air and gently fans it with his wings, just as the Hopi does with his feather whip, which soothes its anger. After it uncoils and starts to run away, he safely grasps it in his talons and carries it to some perch, where he kills it and disposes of it at his leisure.

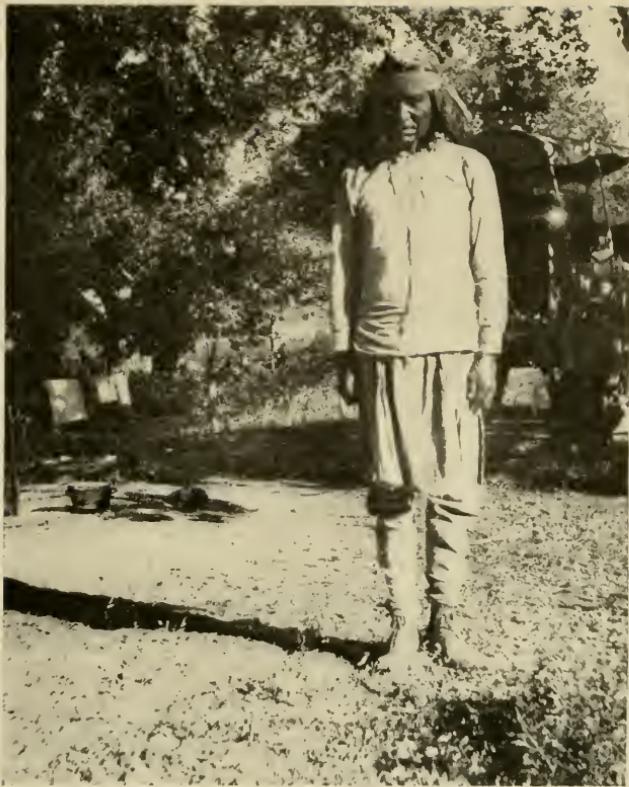
The Hopis have over three hundred Kachinas, and hold many Kachina dances during the year. On one of my trips to the Hopi villages, in July, 1908, I happened to arrive at Walpi during one of these dances. It was given by thirty-five Hopi men from Moencopi, who traveled eighty miles on foot to visit their Walpi kinsmen and celebrate the dance. The visitors were the guests of the village during their stay and were lavishly entertained. The ceremonies occupied three days and were full of action and interest.

The dancers were elaborately and gorgeously costumed and the exercises serious and dignified. The costumes were all alike and consisted of a face mask, a head dress of feathers, a gray collar made of pine needles, black velvet tunic and the regulation brocaded sash and kilt, and beaded moccasins. The meeting was on the open plaza and free to all who wished to attend. The dancers were a fine looking lot of men and went through their evolutions with ease and precision. Only the visitors participated in the dance, who acted under the command of a local board of caciques. During intervals of rest between dances, the men visited by themselves at a separate spot on the open plaza and ate ripe apricots, which they had brought with them from home, in boxes. The council of old men sat in a circle at an open meeting, smoking cigarettes and conversing in undertones, as if they had secrets to tell which they did not wish strangers to hear.

Supela is regarded as one of the big men among the Hopis and is, indeed, very wise. He is familiar with the secret rites and rituals of all the various clans and is consulted on all difficult points of order. He is now old and feeble, but is still full of grit and persists in trying to do something. The last time I saw him was at the snake dance at Walpi in 1915, when he appeared with the marching Snake priests in the dance, but he soon found that he could not keep up, and had to quit.

Saalako, his wife, is also a remarkable woman. She is the chief Snake priestess of all Hopiland and holds the secret and prepares the mixture of the wonderful snake medicine, which is used in all of the pueblos. By birthright her son Kopeli became head Snake priest of the Walpi clan and was the greatest leader the society ever had. He died several years ago comparatively young, when his younger brother Harry took his place.

The snake dance may be a barbarous practice, but the participants in it are just as earnest and sincere as is the Christian in his religious devotions. Their facial expression denotes earnestness and consecration. I saw an unusual manifestation of this spirit at the ceremony held at Mishongnovi in 1915, on the day previous to the Walpi dance. A Snake priest, wrapped in his blanket, came up out of the kiva, walked slowly to the edge of the mesa and with eyes closed and head bowed, knelt down and engaged in silent prayer. A white devotee could not have done it more impressively. Their mode of worship is entirely different from ours and shows the difference in people. We think other people queer who are not of our faith and practice and they think the same of us.



Our Apache Neighbor



An Apache Camp

The dance held at Mishongnovi was the best of four dances that I have seen. It was more of a home affair and given for a serious purpose. Besides the unusual sight of seeing a Snake priest engaged in prayer, another incident happened which was also out of the ordinary. During a pause at the beginning of the dance several Snake men met in a brief consultation. Directly one of their number walked out among the spectators and spoke to a stranger, who followed him into the kisa, where he proceeded to hand out the snakes like an old hand at the business. He was evidently recognized as a Snake brother from one of the neighboring villages who was attending the performance as a modest visitor. When his presence was discovered, he was asked to assist in the ceremony, which was a fine act of courtesy.

Another feature of unusual interest was a huge bull snake that was used in the dance. It was as thick as a boy's arm and over six feet long, and was all that two men could handle. When held in the usual position by the dancer, its tail dragged on the ground. Its bite was harmless, but it possessed wonderful strength, which kept its captors busy to control it. I also saw the strange sight of an albino Antelope priest who had light hair and fair skin, and was leader of the Antelope Clan. Albinos are common among the Hopis, but it is seldom that one acquires the distinction of becoming a leader.

As a people the Hopis are very conservative and slow to make any changes either in custom or costume. Because of their steadfastness of purpose, and perhaps, too, on account of their remoteness from civilization, they retain more of their originality than do any of the other tribes. Influences, however, have been at

work for many years to induce them to make changes, which have been partially successful, by dividing them into two factions that are known as the Friendlies and Hostiles. The former are willing to alter their mode of living and adopt modern methods, while the latter oppose any change and prefer to follow strictly in the footsteps of their fathers.

In 1907 the dispute between the two factions in Oraibi, where the feeling was most intense, grew so bitter that it resulted in an open rupture and separation. Fully one half of the population seceded and moved out to a new location at a spring six miles away and built the village of Hotevila. There the hostiles are now gathered in a last effort to resist the demon of change and to preserve, if possible, their original independence and purity untarnished.

A difference is already noticeable in the conduct of the members who comprise the two factions. The hostiles practice the same simple life which they have always lived, with all that it implies of honesty, frugality, industry and hospitality, and hold sacred the customs and traditions that have been handed down from the past. The friendlies, on the other hand, are willing to make changes and are becoming modernized. They are apt pupils in many things, but their ignorance and simplicity are not always sufficient to discriminate properly between the good and the bad when they are sometimes victimized by unscrupulous whites.

On my first visit to Walpi in 1901, where the change has been greatest, our party of four rented from a friendly a government built vacant house, at the foot of the mesa, for the sum of one dollar and fifty cents for the four days of our expected stay. Much to our



Drawing Rations



Starting for Home

surprise the landlord called each day and collected his rent in the same amount. We regarded the additional tax as an imposition but concluded that we could better afford to pay the demand than to dispute the claim. Our landlord also seemed to think that we ought to furnish free lunch for himself and friends whenever they called, and the number of visitors who came daily about meal time was numerous, but here we drew the line, and the hungry horde got nothing.

A hostile under like circumstances would not have violated his pledge nor disgraced their traditional hospitality by asking or taking any gifts or money. A friendly will not even stand for a picture unless he is well paid in advance. Here again a hostile will not compromise himself, and either shows indifference to the proceedings, or quietly turns and walks away. On the last day of our stay, the landlord called as usual for his rent on his way home from the field, with two burros loaded with corn fodder that made a tempting snapshot. One of our party wished to take a picture of the cavalcade, but was asked first to agree on a price. The sum demanded was exorbitant and no agreement was reached. While the negotiations were in progress I was busy about the camp, but not so much occupied that I did not notice what was going on and unobserved got a good picture without cost. I considered this "extra" nothing more than right and just, in order to break somewhere near even on the house deal.

As an illustration of the Hopis' natural goodness I will cite but a single instance. During my stay in Oraibi at the snake dance in 1902, I was asked by a hostile to see a sick boy. Upon leaving the house the mother offered me a boiled ear of green corn which

was then in season. Its intrinsic value was small, but not to be outdone in courtesy by a heathen, I accepted the gift with thanks. It doubtless meant much to the giver, as she was poor, and the ear of corn, or its equivalent, might be sorely needed before another corn crop could ripen. The act not only showed honesty and a desire to meet an obligation, but was also a generous act of courtesy, that denoted appreciation and betokened genuine hospitality.

The children are being taught in schools located in the several villages and in a large government school in Keam's Canyon. The curriculum includes sanitation, modern cooking and neatness in housekeeping. The girls are particularly benefited by this training, as it fits them for domestic service which they readily find in white families after they leave school.

On my trip to the snake dance in 1915, I had an opportunity to observe some of the practical benefits of such training. Two Hopi girls were employed by young Lorenzo Hubbell, who keeps a trading store at Keam's Canyon, and entertains travelers going to and from the Hopi villages. Their positions involved much responsibility, as guests were going and coming continually. They had full management of the house and conducted its affairs in their own way, and seemed to give entire satisfaction to all concerned.

The Navajo girls are receiving similar instruction with like good results. At the home of the elder Hubbell at Ganado, three Navajo girls were employed as house maids, who also gave good service. The native help is satisfactory if properly treated. Patience and kindness work wonders in stimulating honest efforts and creating a desire to please. With good treatment the Indian girls are usually contented, but harsh treat-



A Happy Family



Apache Mother and Child

ment makes them homesick and morose, when they soon quit and go home.

Visitors going to the snake dance usually leave the railroad either at Gallup, Holbrook, Winslow or Flagstaff. They often go in parties, but must be prepared to camp out, as there are no hotels or other stopping places on the road. The Gallup route seems to be preferred by many as it affords the best facilities. A stop at Hubbell's is alone worth the trip. Anybody who has the good fortune to receive the hospitality of this home will not be disappointed, as the host knows how to entertain friends and takes the very best care of his guests. His never failing kindness and generosity are above praise, and are doubly appreciated in a country where everything is new and the conveniences and comforts of travel are yet few.

CHAPTER IV

THE FLAGSTAFF REGION

FLAGSTAFF, Arizona, is located in a natural park of pine trees near the base of the San Francisco Mountains, which are nearly thirteen thousand feet high and the highest mountains in the state. Its elevation is seven thousand feet above the level of the sea, and it is blessed with an exceptionally fine climate, that is favorable to an all-year-round residence as well as an ideal spot for camping out. Many visitors go there every summer to spend their vacations in an outdoor life among the pines. The altitude is stimulating and the atmosphere exhilarating and always full of the sweet fragrance of pine. The air is cool and bracing and evaporation active, which adds much to the physical comfort. Weeks and even months can be spent in pleasant and profitable sightseeing without exhausting the field. But the town needs a good hotel; and the neglected and untidy appearance of its streets gives the impression to a stranger that its leading citizens have not improved their opportunities as they might have done.

It is a region that has more diversified life than any other place on the globe, as each one of seven different life zones is represented. Upon the near desert are found plants and animals that are natives of the tropics, and by a gradual rise in elevation each successive life zone is populated by a flora and fauna of its



Munk Ranch



Ranch Corrals

own, that culminates in specimens of Arctic life on top of the San Francisco Peaks.

Tropic life made its way there from the Sonoran Desert, through the Grand Canyon, and its Arctic life was imported from Labrador on the ice during the Glacial period. Other life that is found in one or more of the different zones came from intermediate sources, so that not a single link in the chain is missing. The region is especially noted for its variety of insect life, and students of entomology are invariably referred there by teachers and experts in that branch of science.

Above six thousand feet of altitude the rainfall is sufficient to grow trees and the Coconino forest, upon the Colorado Plateau, is one of the largest woodlands in the world. This wooded country forms a large aboreal island in the midst of a gray desert, that makes it doubly attractive. To find so many different life zones thus closely associated within the small radius of twenty-five miles, is something unique and unexpected in life distribution.

The greatest natural attraction in the vicinity of Flagstaff, or in the world, is the Grand Canyon of Arizona. People who are not familiar with the geography of our country sometimes confound the Grand Canyon of the Arkansas River in Colorado with the Grand Canyon of the Colorado River in Arizona. There is only one Grand Canyon and that is the Grand Canyon of Arizona.

There can be no question as to the largeness of the great gorge, as it has been pronounced many times, by competent judges, to be the greatest natural wonder in the known world. It was built on such a vast scale that it has established a new standard in dimensions,

to which the senses have to be reeducated in order to fully comprehend its meaning, and that requires time. But as big as it is, by comparison it is only like a pin's scratch in the earth's crust. The Canyon has never been adequately described nor, indeed, ever will be, although it seems to be more written about than any other object in the universe.

The Pacific slope had many upheavals and submersions in its ancient sea bed, during its millions of years of evolution into a continent. Being a volcanic region, it was frequently disturbed by seismic action, that extended over a wide territory during long periods of time, and doubtless had something to do with the origin of the Grand Canyon. The entire Southwest is seamed with fissures of similar character, but made on a much smaller scale, of which Canyon Diablo, thirty miles east of Flagstaff, is a good example. The country is nearly flat, and under a thin layer of soil rests a thick bed of limestone. In this rock are many long deep fissures that make cross country driving very difficult. Where these crevices occur in low places they are called "bottomless pits" and serve as drainage canals to carry off the storm water during the rainy season, that finds an outlet in some far off valley or deep canyon in a permanent spring or rivulet.

Two miles east of Canyon Diablo is a modern fissure that was made in recent years and has a history. It is an exact replica of the older ones, as they all look alike. During the summer of 1887 a number of earthquake shocks were felt in Arizona and Sonora, when some new fissures were reported. It was believed at the time of the occurrence, that some volcanic eruptions had also taken place, as great columns of smoke were seen in the distant mountains, but investigation



Cattle under Herd at a Roundup



Open Range Horse Pasture

failed to locate any new crater. The smoke, it was ascertained, had been caused by forest fires; and clouds of dust, which looked like smoke, were produced by landslides caused by the trembler.

I was at Canyon Diablo in 1901, where I first met F. W. Volz, who had lived there many years and was familiar with the country. He told me about the new fissure, and we rode out together one day to see it. The cleft was readily located and proved to be from a few inches to several feet wide. Mr. Volz stated that he had followed the aperture nearly one hundred miles north to the Hopi village of Mishongnovi on the second mesa. The Indians, also, recall this occurrence and speak of the surprise and alarm which it gave them. The bed rock was split irregularly in a zigzag course and some broken pieces of rocks were displaced. I sounded the depth of the fissure in a number of places with an improvised plummet, by tying a piece of rock to a one hundred and fifty foot bed cord. The line was dropped into the crack to its full length without touching bottom.

Six miles south of Sunshine Station on the Santa Fe Railroad and ten miles southeast of Canyon Diablo, is a large flat topped mound that has an unusual crater. When first reported it was commonly called Coon Butte, but is now better known as the Meteorite Mountain. The mount rises two hundred feet above the level of the surrounding plain, and its bowl shaped crater is six hundred feet deep and a mile wide. There are eleven acres of level land at the bottom of the hole. It is not a volcanic crater, but was caused by the impact of a mammoth meteorite, or asteroid, which fell out of space and struck the earth at that point. Millions of tons of fine white sand, which is pure silica,

are piled up on the rim above the tilted rocks that were ground to a fine powder by the crushing blow and thrown out of the big hole by the terrific force of the impact. This sand is not of the ordinary kind but is finer than bolted flour and absolutely without any grit.

About ten tons of meteorites of different sizes, varying from the fraction of an ounce to one ton in weight, have been gathered in the vicinity of the mountain, the smaller pieces lying close in and the largest piece as far as eight miles out. These fragments were torn from the great meteor during its passage through the air, and before the large mass buried itself in the earth. The meteorites are almost pure iron, but also contain traces of nickel, cobalt, platinum, iridium and diamonds. The fact that meteorites contained diamonds was first discovered by Dr. Foot of Philadelphia; and later Sir William Crookes of London announced that their presence in the meteorites proved that diamonds were of celestial origin. Although the meteorites are only slightly, if at all, magnetic, there are many small pieces of magnetite which are dead sparks from the meteor, scattered plentifully over the earth in the meteoric zone, that are highly magnetic and possess marked polarity. I obtained several of these magnetic pieces from Mr. Volz picked from two barrels full standing in his door yard, to demonstrate this wonderful force of nature in an unexpected manner.

A few years ago a company was formed by Professor S. J. Holsinger, to explore the crater and ascertain the exact nature of its contents. The company encountered many difficulties and made slow progress. Unfortunately the work was never finished owing to the untimely death of Mr. Holsinger. The first excavations



Tyuonyi



Ceremonial Cave

proved nothing conclusive, but the final borings made with a diamond drill were successful. Several holes were sunk in the bottom of the crater, the last one being twelve hundred feet deep, in which the drill struck an unusually hard substance and brought up a three foot core of meteorite. It was almost impossible to penetrate the metal on account of the presence of diamonds, which destroyed the cutting edge of the steel drill to such an extent that it had to be removed frequently and sharpened. This discovery established the fact that the crater was caused by a meteorite, but the size of the ore body has not been determined.

The volcanic field of the San Francisco Mountains is only one of several large areas of a similar character in the Southwest. Extensive lava flows exist both east and west in New Mexico and California. Thick beds of black lava can be seen from the car window in many places along the Santa Fe railroad as the train speeds by. It has been estimated that there were at least five successive periods of eruption, of which the last one occurred about ten thousand years ago. In the volcanic field of the Flagstaff region are three hundred extinct volcanic craters, and piles of cinders and lava that are hundreds of feet deep, cover three thousand square miles of territory. The volcanic cones range from a few feet high to mountain peaks that reach thousands of feet into the sky. None of the volcanoes are active at the present time, nor have been in recent years, but it is entirely possible for them to revive again at any time in the future. Volcanic ash is mingled with the soil in this region, which makes the land unusually fertile and productive.

The lava slag and cinders look as fresh as if they had come out of the furnace only yesterday. There is

something remarkable about the preservative properties of the pure dry air of the desert that retards decay and the aging of natural objects to a wonderful degree. To this cause is attributed the well preserved cliff dwellings and their contents, that have been in ruins for centuries. Impressions made upon the virgin soil are also slowly effaced, and the tracks of vehicles and large animals can be traced in the earth for a long time, even after the land has been deluged by torrential rains.

Next to the San Francisco peaks, and situated fourteen miles northeast of Flagstaff, is a smaller group of mountains that are of much interest. Prominent among them is O'Leary's Peak, but Sunset Mountain is the most conspicuous on account of the bright halo of sunset glow that covers its crest at all times and can be seen at any hour of the day whether there is sunshine or not. The halo is produced by a combination of three kinds of colored volcanic rocks, white, red and yellow, that line the rim of the crater. A few straggling pine trees grow on its brow and some large trees stand in the bottom of the hole. The trees look weird and out of place amidst their desolate surroundings, where the furnace fires even yet do not seem to be fully extinguished. Its western aspect is indented by a shallow ravine, that is sometimes used as a trail for climbing to the top. At its base, and extending northwestward towards O'Leary's Peak are large beds of lava and great piles of cinders that are separated by a distinct line of demarcation, as if it had been done by the intelligent hand of man. Midway between the two mountains is a large circular hole in the cinders that is called the Black Crater and was once the source of a big lava flow.



Head of the Rito



Pueblo Dance, Acoma

I visited this region for the first time in 1902, when I climbed to the top of Sunset Mountain. I did not follow the trail but went up the north side all the way in loose cinders. The footing was insecure, which made climbing laborious and slow, as I sank to my knees at every step, but I took my time and struggled on until I finally reached the top. The view from the heights is magnificent and was well worth the effort, as it gave an extensive view of the whole volcanic field.

Another peculiarity of the region is some ice caves that seem to be connected with the volcanic conditions, but have never been fully investigated or described. Ice caves in general are unusual and of infrequent occurrence. Mark B. Carr, in a Sierra Club Bulletin of 1903, describes an ice cave in the Modoc lava beds, and the Flagstaff ice caves are of a similar character. The largest of these caves is located eight miles southwest of Flagstaff and is a cavern of considerable size, large enough at least for people to get lost in, as has happened on more than one occasion.

The cave has been known for many years and has furnished much ice for domestic use, when the commercial article was not available. New ice has never been known to form in the cave and where the ice has been removed it never reforms in the empty space. During recent years a large reservoir was built near the ice cave, by a mill company, for storing water. From this dam water is filtering into the cave and slowly melting the ice.

Another ice cave is found in the lava bed at the foot of Sunset Mountain, in the midst of an inferno of volcanic debris. The entrance is through a sloping tunnel in the lava which is large enough to admit the body of a man in a stooping position. I started to explore the

cave in the summer of 1914, but at a distance of about twenty-five feet I found the passage blocked by a wall of ice that stopped further progress. The cave was ice cold and felt very refreshing after coming in out of the hot sunshine and torrid heat of a sizzling summer day. I broke off some of the ice and used it for cooling the drinking water. It was as sweet and pure as the best artificial ice. Both of the ice caves are in lava and cinders, the last place on earth where anybody would look for ice.

Frost never penetrates far below the surface of the ground and ice does not naturally form in the earth. The earth is warm from the surface down and the temperature increases rapidly with depth. How the ice ever got into the caves is not known and the problem is yet an unsolved mystery. The only plausible theory of its origin that has been suggested, is that it is glacial ice, formed and transported from the far north during the glacial period, and deeply buried under the falling cinders, while the volcanoes were in eruption. It thus became possible for the ice to be preserved by the cinders, in the same manner that it is stored and kept in sawdust pits in an ice house for an indefinite time.

Owing to the porous nature of the volcanic soil in this region, water is scarce and hard to get. It is either conducted in pipes, from springs in the mountains, or taken from reservoirs constructed for gathering and storing surface storm water. In the town of Williams, thirty miles west of Flagstaff, repeated attempts have been made to find water by digging, and some wells were sunk to great depths without finding any of the precious fluid. However, it was found that the porous cinders upon which the town is built, furnished a good



Seeking Adventure



The Chuck Wagon

drainage system, that has been used ever since as a channel for sewage disposal.

Any hole that is dug into the cinders fifty feet deep or over, taps a cold air chamber from which rushes a current of air that is strong enough to "blow the hat off of your head." This action is most noticeable during the middle of a hot day. The cold air chamber must have some connection with the ice caves, of which there may be others not yet discovered in various parts of the volcanic field, all together forming a vast subterranean cold storage plant that is in continuous operation. The subject is at least interesting and calls for speculation and investigation. It is just as possible for glacial ice to lie buried beneath mountains of cinders as it is for Arctic life to exist on the top of the San Francisco Peaks. After this natural force once got started on its long journey from the Arctic to the Tropic zone, it moved steadily forward until it fulfilled its strange destiny in the manner described.

There are some ancient cave dwellings a short distance east of Flagstaff and a few cliff dwellings in Walnut Canyon ten miles southeast of town, but these houses are small and inferior to many cliff houses that are found in other places.

Not least among the many attractions of Flagstaff is the Lowell Observatory that was established twenty-five years ago.

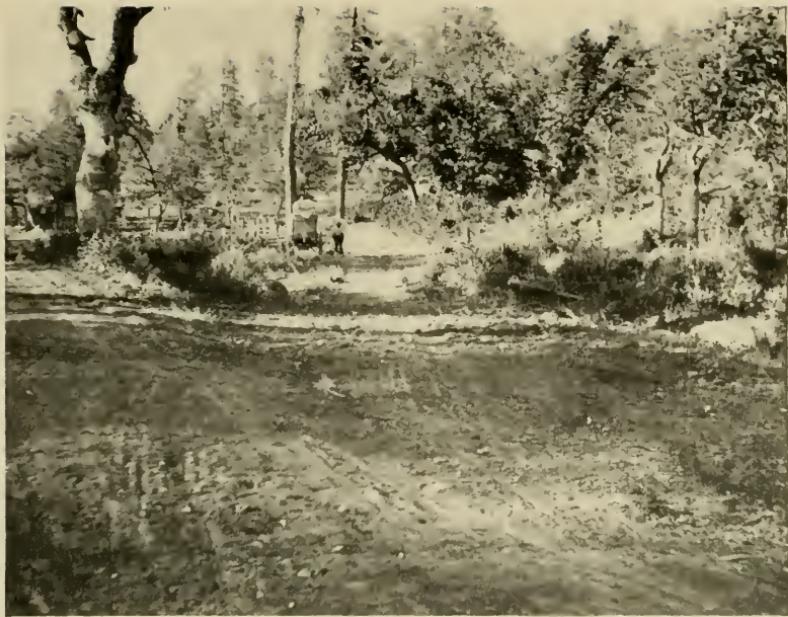
After Sir William Herschel had noticed the white polar caps and Schiaparelli had discovered the canal markings on Mars, Professor Percival Lowell decided to make a special study of the planet and cast about for a suitable location for an observatory. After spending some time and visiting many places, he decided that Flagstaff offered the best site for his pur-

pose, on account of its steady clear atmosphere, which is essential to good vision through a telescope. The results of his observations and studies have been given to the world in a series of bulletins and books that are as thrilling as fiction and yet are scientifically true. He has demonstrated beyond a doubt that Mars is supplied with both air and water and is inhabited by intelligent beings, who have a complete co-operative system of irrigation that covers the entire planet.

Mars is practically a flat nearly level plain and has neither oceans nor mountains. In bulk Mars is about half the size of the Earth and its year is twice the length of our own. The nearest that the two planets ever approach each other is thirty-five million miles, at which time we get our best view of Mars. Although smaller in size and younger in years according to the reckoning of our calendar, Mars is much older in maturity than the Earth. The aging of a planet depends more upon its size than its years, the small planet growing old first and the larger one retaining its youthfulness for a much longer period. Being smaller and lighter in weight its force of gravity and power of attraction are also proportionately less.

As a planet ages it gradually loses its water and its atmosphere grows attenuated and clear by the loss of water vapor. All of the large planets are yet so beclouded by vapor that little or nothing of their surface can be seen, but in the clarified air on Mars objects are plainly visible from the Earth, under favorable circumstances, through a good telescope.

Mars is rapidly growing dry and what little water remains is being carefully conserved to meet the necessities of life. During the winter season the water collects at the poles in the form of ice and snow and when



Parting of the Ways



Cottonwood Camp

they melt in the spring, the water is systematically controlled and conducted over the land in artificial canals, to grow the crops which are necessary to sustain life.

The conditions prevailing on Mars are being duplicated upon the Earth, as it too is undergoing changes that mean a progressively attenuated atmosphere and diminished water supply. Two desert belts already girdle our globe on the lines of the two tropics of Capricorn and Cancer. One of these belts crosses southern California, Arizona, New Mexico, western Texas, the Sahara, Arabia Petræa and the desert of Gobi. The other one traverses Peru, the African Veldt, and western Australia. In these regions are few clouds and little rain and by reason of the scanty rainfall and excessive evaporation, dry land is found in some places below the sea level. These arid belts are gradually widening and are destined eventually to cover the whole Earth, when our fate will be like that of Mars.

The objects that are seen on Mars in the order of their visibility are its white polar caps, light and dark areas, that are crossed by lines which represent the canals, and oases, where the canals meet and connect with reservoirs. The hairlike lines that are seen on Mars through a telescope are not the actual canals, but strips of green land twenty-five miles wide, that are fed with water from the canals and covered with vegetation.

The polar caps of ice and snow are analogous in appearance to the Arctic and Antarctic regions of our Earth. They are seen to increase in winter and decrease in summer with great regularity, but never disappear entirely. At their maximum spread they cover

more than one hundred times as much surface as when reduced to their minimum. In the depth of winter they extend far towards the equator, but when spring comes and the ice and snow melt, the caps recede and become surrounded by blue-green bodies of water that fills the canals and flows away to irrigate the cultivated fields.

Mars is a desert and shows its character by its bright colors. Its prevailing tint is red, which gives the star its fiery appearance and the name of Red Planet. Professor Lowell uses the Painted Desert of Arizona to illustrate the arid condition of Mars. He says: "The great ochre stretches which are seen on its disk are unchangeable and show the same, day after day throughout the year. In hue they range from sand color to brick red, some parts of the planet being given to one tint and some to another. The Sahara has this same look; and more striking yet is its counterpart in the far aspect of the Painted Desert of Arizona. As seen from the San Francisco peaks the likeness of its lambent saffron to the telescopic tints of the Martian globe is very impressive. Far forest and still farther desert is transmuted by distance into mere washes of color, so bathed in the flood of sunshine out of a clear sky that the tints rival those of a fine opal; and the dark ribbon bands of green, like those on the banks of the Little Colorado River, makes the resemblance complete."

By careful and persistent scrutiny Professor Lowell greatly extended Schiaparelli's discoveries and found lines that cover the entire surface of Mars in a world-wide system of water distribution. They reach from the poles to the equator, tapping the fountains of water at the poles and carrying it in canals to all parts of



Primeval Forest



Black River

the globe. The canals, without exception, run on geodetic lines and invariably begin and end at definite points connecting the blue-green areas of water near the poles with the dark spots known as oases, where the reservoirs are located. They are evidently artificial and designed to serve some useful purpose—manifestly for carrying water from regions where water is found to parts where water is needed for purposes of irrigation. The canals are not visible at all times, but appear and disappear at regular intervals with the change of the seasons. When they reappear after a period of subsidence, they always occupy the same places, which proves that their positions are permanent. In some places the water seems to flow uphill and against gravity, which denotes that it is propelled by some artificial force, or pumping plant.

The question has been asked: "What manner of men are these people who do such remarkable things? Evidently they must be superior both physically and mentally to mundane man. Because of the lesser pull of gravity, the Martian must be a creature that is much more powerful than an Earth inhabitant. He can run one hundred yards in four seconds, leap over a high tree and kick a football a quarter of a mile. He is supposed to be many times larger than a human being, and strong enough to handle two and a half tons of earth at a shovelful. On account of the rarefied atmosphere on Mars, he must require three times as much lung space as an Earth mortal, to get enough air to live, and his body must be proportioned accordingly. Bodies on the planet Mars weigh only a third as much in proportion to size as they do here; so it is believed that a Martian laborer can perform as much

work in a given time as fifty terrestrial ditch diggers can do."

Contemplating the heavens, the multiplicity and magnitude of the stars and the millions of years that were required to create them; the inconceivable extent of space and the unnumbered worlds that hang balanced on nothing, ought to be sufficient to take the egotism and conceit out of puny little man, and make him feel what an infinitesimally small atom he is in the creation.



White River



An Arizona Trout Brook

CHAPTER V

THE PETRIFIED FORESTS OF ARIZONA

Fossil wood is found in many countries, but nowhere in such profusion or variety of bright colors as in the petrified forests of Arizona.

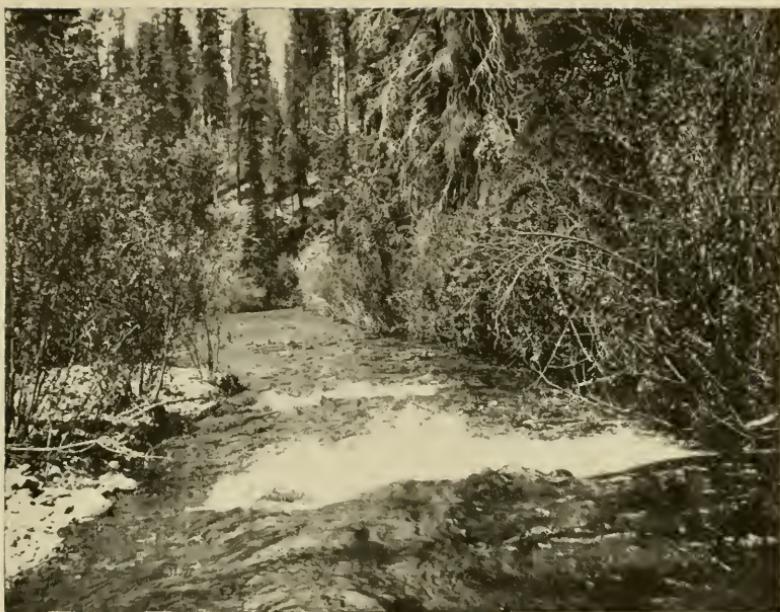
A knowledge of the wood is of comparatively recent date. It was first described in reports of government explorations and surveys, made during the fifties, to find feasible routes of travel to the Pacific Coast. Soon after the discovery was made public, the relic hunters began a campaign of vandalism by shattering many of the giant trunks with explosives in order to obtain the precious gems which some of the trees contain; and they also carried away much agatized wood.

Later on large quantities of the crude material were shipped east in car load lots to be made into tablets and table tops, but the cost of production was found to be excessive and the high price made it prohibitive to the average customer. Machinery was then invented and installed, for grinding it into emery, but, owing to the cheapness of that article in the market, the enterprise collapsed and was soon abandoned. After many years of delay, Congress finally passed a law to give the wood protection by converting some of the land upon which it is found into a national park.

Professor Herbert E. Gregory, in his second book on the "Geology of the Navajo Country," gives the first complete description of that region. He states that

the abundance of this wood is almost incredible and its presence has made a profound impression on the native tribes. "To the Navajo the logs are yeitsobitsin and the bones of yeitso, a monster who was destroyed by the sun and whose blood was congealed in lava flows. In the Piute mythology the broken trunks are the spent weapons of Shinarav, the great Wolf God, and the accumulated masses mark the sites of battle fields.

"In the Navajo country fossil wood constitutes a characteristic feature of the Triassic sedimentary beds and is found wherever the Shinarump conglomerate or Chinle formation is exposed by erosion. On Lithodendron Creek, in Beautiful Valley, at Round Rock and at Willow Springs, petrified logs and chips are sufficiently abundant to justify the term fossil forests. At these localities solid logs exceeding fifty feet in length may be counted by the dozen, blocks three to ten feet long occur in hundreds and scattered chips are innumerable. At other localities the wood is only slightly less abundant. In the North Forest, on Lithodendron Creek, where the trees are best displayed within an area of about twelve hundred acres, a number of logs have lengths of from thirty to forty feet, and diameters of three to four feet; the longest seen is about seventy feet in length and measures six and a half feet at its flattened butt. The Beautiful Valley Forest, covering about three square miles, contains ten logs between fifty and eighty feet in length and averaging about three feet in diameter, in addition to hundreds of smaller dimensions. The floor of the valley in places is literally paved with blocks of fossil wood. In the Round Rock or Senakahn Forest, the trees are as abundant as at any other place known.



Rushing Mountain Stream



Camping in the Wilderness

Trunks thirty to sixty feet in length, with diameters of one foot to five feet, were measured. The Willow Springs Forest, about five square miles in area, includes dozens of silicified trees in the midst of chips so abundant as to conceal the strata beneath.

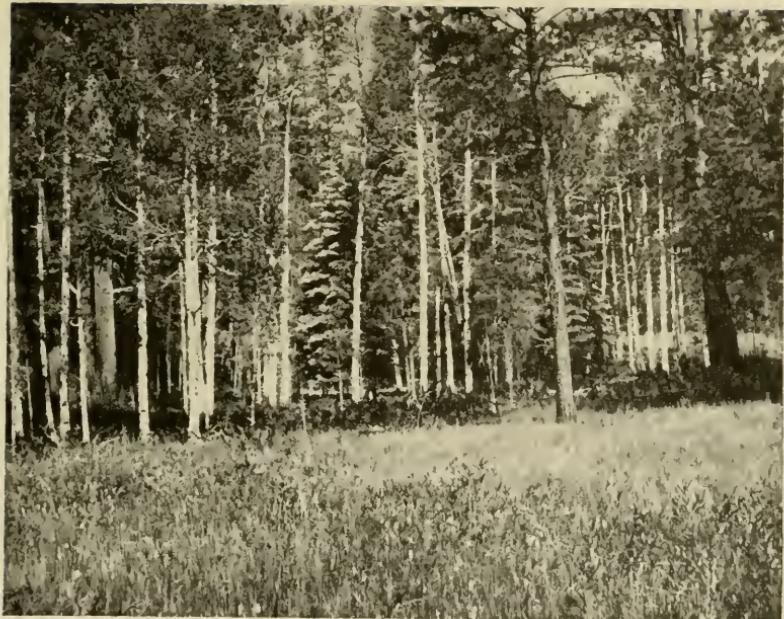
"The tree trunks are very unevenly distributed. They usually occur in widely spread groups of unassorted large and small trees, all lying flat and trending in parallel or diverse directions, or overlying one another like fallen timbers in the path of a tornado. In Nokai Canyon, a nicely laid pile of eight logs seven to fifteen feet long, and three to four and a half feet in diameter, occupies an isolated position and at certain localities only a single log is to be found within an area of several acres. No complete trees were seen; most of the logs terminate abruptly, with worn surfaces at both ends. A few trees are still attached to their upturned stumps, and at several places stumps with root bases attached were noted. There is a singular scarcity of small branches and twigs, and a somewhat careful search for cones and needles resulted in finding none.

"As exposed on the surface the logs are generally broken into segments a few inches to several feet long, arranged in proper sequence. Some trunks are split lengthwise into rails and slivers. The surface of a fracture is commonly smooth and even as if cut by a saw. Most of the trees are composed wholly of silica in the form of jasper and chalcedony; a few consist chiefly of copper and the wood of one log noted is now represented by iron. Coal and lignite were obtained from the interior of two logs embedded in marl, and carnotite was found in the carbonized wood of Monument Valley. Some of the logs are colored in harmony

with the gray sand in which they are embedded, but most of them are colored by iron and manganese, and assume beautiful tones of red, brown, yellow and blue. Superoxidation has added brilliancy to colors on the surface of broken blocks, making the vari-colored jasper a much prized semi-precious gem stone.

“It is believed that the trunks now turned to stone were carried by streams during floods. Many of them have worn ends and battered sides and most of them are without bark. Trees of various sizes and ages are huddled together, the blunt end of one log abuts against the side of its neighbor; and collections of trunks are wedged tightly together with different angles of inclination. The sandstone in which most of them occur is cross-bedded and lenticular, is laterally unconformable, and has other features suggestive of fluviatile deposition. The accumulation of trunks in the fossil forests is closely similar to piles of driftwood now seen along the Colorado, Little Colorado and San Juan Rivers—piles of trunks and branches, some much worn, some still retaining the bark, crowded together and overriding one another; stumps attached to trees or separate in various positions, some upright, some lying on the surface, others buried in alluvian or wind-blown sand. The logs now stranded on the surface of the lava at Black Falls are about equal in number to the fossil trees in Beautiful Valley. Most of the wood, particularly the logs, must have become silicified in its present location, the process being favored by rapid burial, a water table fluctuating through short periods, and the presence of alkaline solutions.”

The forest which is generally known and most frequently visited, is in the vicinity of Adamana, a station on the Santa Fe Railway. It consists of three



Aspen Grove



Mountain Meadow

natural divisions that are known as the Rainbow and Crystal Forests and Chalcedony Park. The forest is not on the Navajo reservation, but is similar to those described by Gregory and belongs to the same group. The wood is found upon a sunken plain on the Painted Desert, between widely separated mesa cliffs and canyon walls. It lies in a depression that is surrounded by a beautiful skyline of mesa cliffs composed of beds of highly colored marls, shales and clays. The presence of so many gorgeous colors on the landscape gave that region the name of Painted Desert. But some people are so unimaginative and literal in their ideas, that they do not recognize nor appreciate beauty even when they see it. Like the young lady who was out on a sightseeing trip and, looking on the brilliant scene, said she had heard of the Painted Desert but if that was the place, she was disappointed as she did not see any paintings. She evidently expected to find a lot of gaudy daubs staring her in the face from a string of conventional billboards.

In an early day a cattle man by the name of Adam Hanna had a ranch at this point. His wife's name was Anna; and when the railroad needed a name for its station, the given names of the husband and wife were joined and the station named Adamana. The accommodations for travelers are limited, but a few tourists stop over nearly every day from passing trains going both east and west. The guests who go to see the forest usually confine their sightseeing to one day and trip, because their time is limited, as tourists are always in a hurry to get to the next place. The short time which the scheduled trip permits gives only a glimpse of what there is to see, but if the tourist can only say that he has seen the forest and can produce

some specimens to prove his assertion, he is satisfied.

The trip to the nearest forest is made by team and wagon some time during the forenoon. The distance is only six miles and the drive soon made. The road crosses the Rio Puerco at a ford that has quicksand, but which is ordinarily safe. During most of the year the river is a broad shallow stream that is easily crossed, but is impassable at its flood stage in the rainy season. A hamper containing drinking water and a light lunch is stowed away in the wagon to furnish midday refreshment. The drive to the forest occupies about an hour, another hour is spent in walking about and viewing the scenery, after which the cavalcade gathers at the Bridge where luncheon is served. The Bridge is a petrified tree that spans a ravine and is quite a curiosity. It is the chief object of attraction and is invariably the first thing called for by the average tourist, as he knows about it from seeing it in pictures and reading about it in books and railroad folders. Some time ago a pillar of masonry was built up underneath to support the middle, and prevent the tree from breaking down, as it had begun to crack and show other signs of disintegration. Another hour is spent in strolling about among the logs and picking up choice bits of wood for pocket pieces, or as souvenirs of the trip, when the call of "All aboard!" is heard and the tired party returns to the wagon and is soon whirled back to the hotel to await the arrival of the next train.

Before Adamana was made a station, visitors to the forest were obliged to go from Holbrook, a distance of eighteen miles. My first visit to the forest was in the summer of 1901, while I happened to be waiting in Holbrook to go to the snake dance at Walpi. Having some idle time on my hands I decided to use it



Recent Earthquake Fissure at Canyon Diablo



Coon Butte Crater

in making a side trip to the forest. I hired a team and driver for a two day trip and went into the forest by the back door, so to speak. The long trip from Holbrook is now seldom made, as nearly everybody prefers to go by the shortest route. People who really care to see the forest make a mistake in choosing the shorter route, as by so doing they miss seeing the most interesting portion. It is impossible to make the round trip from Adamana in one day and see it all and a longer trip is seldom made by special conveyance.

We took along a camp outfit and enough provisions to last during the trip, and headed for a cattle ranch which was known as Jim's Camp. It got its name from three cowboys who had the same name and worked together on the ranch at the same time. We were told before starting that there were water and shelter at the ranch, but when we arrived there we found an empty cabin and a dry well, which had been recently flooded and filled with debris by a cloudburst. It was in the rainy season and some muddy water in a ditch gave the horses a drink and furnished a chocolate colored fluid for making coffee. The water looked uninviting but thirst had to be quenched, and when tasted was found to be better than it appeared.

We drove over most of the forest and went clear through to the Bridge at the farther end. Broken pieces of fossil wood were scattered about in every direction in abundance. In places the logs were strewn so thickly that they could be walked on over quite a distance without the feet touching the ground. The trees are all black or brown looking upon the outside but if a log is split open or broken up the inside wood shows all kinds of bright colors—red, yellow, blue, purple, white and black. The colors are usually dis-

tinct and separated from each other and again blended together to fade away in many shades of neutral tints. The colors are permanent and do not change in appearance when exposed to the air and sunlight. Wetting them seems to brighten the colors for the time being, and for this reason the forests show to the best advantage after a rain. Although most of the wood has a bright hue, yet for some unknown cause the natural color in some of the trees has not changed in the least. Whenever such a log disintegrates, it splits with the grain into many small pieces that look like chips. The debris forms small mounds which resemble piles of dry chips in some old time woodchopper's camp and seem only waiting the touch of a lighted match to make them burn. From their natural appearance it is hard to believe that they are not real wood, until tested and judged by their weight and metallic ring.

Many kinds of gem stones such as agate, jasper, chalcedony, amethyst, topaz, etc., are found among the broken pieces of wood. To stand in the midst of such lavish wealth creates a desire to possess some of them, but what to choose or how to dispose of them is another question as the rules of the forest service forbid carrying anything away. Usually the impulse ends by the victim smothering his desire, or casually picking up a few small pocket pieces and heaving a sigh of regret that so many attractive specimens have to be discarded and left behind.

The source of the many different colors appears to be in doubt. They are said to be due to the oxidation of iron and manganese, but if this be true, why is the outside of the tree, which is most accessible to oxygen, always black and only the inside of the tree, where



Navajo Thrift



"Home Sweet Home" — Navajo Hogan

oxygen has small chance to act, painted in bright colors? Again, it is claimed that the colors were absorbed from the highly colored soils in which the wood is imbedded. But this theory also is improbable, even if it were possible, in view of the fact that in the North Forest where the colors of the soil are the most vivid, all of the wood is black. The fact is that neither the process of petrification nor coloration is understood and theorizing on the subject is only guesswork.

Geologically speaking the region dates back into Mesozoic time and the Triassic formation of the reptilian age. To become fossilized, the wood must be immersed for a long period in highly mineralized water, when the atoms of organic matter are gradually replaced in some mysterious manner by other atoms of some inorganic substance until the structure is completely changed and petrified.

Broken pieces of fossil bones of the Saurian family are also found among the arboreal remains, but no complete skeleton of any such creature has yet been discovered in that region. In searching for specimens I found one fossilized vertebra and a section of an acetabulum or socket joint.

The trees are said to belong to the cone bearing family and two varieties have been identified and named as the *Araucarioxylon Arizonicum* and *Woodworthia Arizonica*. When John Muir investigated the forests in 1906, it was reported that he had found the *Sigillaria* tree among the ruins and named a spot in the North Forest where it is the most numerous, as the *Sigillaria* Grove. This tree is supposed to be very ancient and has been extinct for ages. Its substance during growth was soft and of the endogenous variety of vegetal development, in contradistinction to hard-

wood trees, which enlarge by exogenous layers, as is evidenced by their annular rings. The bole is curiously marked by pittings in the body that run in spiral circles around the stem and show where the leaves or branches were attached.

Mr. Muir was anxious to find a specimen of petrified fruit, but after a long search, failed to realize his desire. Some time after he had returned home, Al Stevenson, who was custodian of the forest and proprietor of the Adamana Hotel, and always on the hunt for specimens, found what appears to be the thing sought, a perfect carpelite of petrified fruit; and at another time he also found an equally perfect specimen of a petrified flower. As far as is known, these are the only specimens of the kind in existence, and with other typical specimens of wood, roots and bark from the petrified forests, are on exhibition in the Southwest Museum in Los Angeles, California.

Mr. Muir first described the Blue Forest, and gave it its name because much of the wood has a blue tint that is different from anything found elsewhere. On my first visit to the Blue Forest in 1910, I was surprised to find a system of small roots that occupied their original position where they grew in the earth, and are the only petrified roots that have ever been found. I also obtained some fine pieces of blue wood and other absolutely perfect pieces of bark. The Blue Forest is about the same distance from Adamana as the old forest, but requires a separate trip as it is not included in the itinerary of any of the other forests.

After returning from my trip to the Blue Forest, I heard for the first time of the existence of a Black Forest nine miles north of Adamana. I engaged Mr. Stevenson to take me there and early the next morning



Crossing the Rio Puerco



The Eagle's Beak

we drove out over a good natural road on an easy upgrade, until suddenly we found ourselves on the brink of a high cliff of volcanic tufa overlooking the Carrizo Creek Wash. Before us lay a vast amphitheater that spread out in a wide semi-circle of buttressed buttes and graded terraces extending upwards and backwards to a high mesa skyline in the far distance. It is a brilliant scene that stretches away in every direction to the limit of vision.

I thought that I knew Arizona and had seen the Painted Desert many times, but now for the first time I saw the real thing. This new wonderland of bright colors and variegated landscape was a revelation. The view is unsurpassed and as a painting makes a fit companion piece to the Grand Canyon of Arizona.

There is no wagon road into the valley from the south rim and we descended into the depths by a steep, winding trail in order to obtain a nearer view. The scenery is more picturesque and the going more difficult than in any of the other forests. On account of the distance and roughness of the road, few persons care to travel it and prefer to take their view, seated and resting, from the rim of the cliff.

The *Sigillaria* Grove is near the farther end of the forest and is apt to be missed without a competent guide to show the way. It requires an entire day to make the trip, and like the Grand Canyon, every turn in the road brings a new surprise. I noted especially one peculiarity, that while in the south forests all of the exposed clay banks are covered with water polished pebbles, in the north forest these stones are absent, but are replaced by sharp volcanic cinders that are hard on shoe leather.

There are also some ancient ruins and rock carvings

found in the vicinity of Adamana that add much interest to the place. On top of the banks of the Rio Puerco is an old Pueblo ruin where some excavating has been done which has resulted in finding many interesting relics of the past. Upon the talus of the mesa cliffs are many large broken rocks covered with hieroglyphics that must mean something but are not yet understood. These carvings were evidently done with implements made of petrified wood, as particles of this substance have been extracted from the markings and identified with the magnifying glass.

During our ride home I remarked to Mr. Stevenson how very interesting it was to visit these old ruins and picture in imagination the people and life that once flourished there. My companion said he was glad that I had mentioned the subject and confessed that he, too, had indulged in some fanciful reveries about the past. "But," said he, "I never speak of it to anybody as I sometimes think that I am growing 'nutty' on the subject and people who heard me might think that I was 'bughouse.' "



The Rainbow Forest



The Bridge

CHAPTER VI

EL RITO DE LOS FRIJOLES

SANTA FE, New Mexico, is one of the three oldest cities in the United States, its two rivals for that honor being Tucson, Arizona, and Saint Augustine, Florida. These cities date back to early Spanish days, but the exact time of their origin is not altogether certain.

Santa Fe has a romantic history and, since its beginning, has been an important center of population and traffic. As the seat of Spanish government it was used in spreading colonies and missions throughout New Mexico, which then embraced an extensive territory. Before gold was discovered in California, it was a convenient trading post for the Indians, hunters and trappers and a favorite resort for hardy adventurers who traveled through the wild and unexplored wilderness of the Far West.

The long road from east to west for all kinds of travel, was for many years over the old Santa Fe Trail, which is now the route followed by the Santa Fe Railway. The trail divides into two branches at Santa Fe, one going south into Mexico and the other west to Los Angeles and the Pacific Coast. After the railroad was built the trail lost its importance, but is again gaining favor under automobile travel and the good roads movement.

The town of Santa Fe lies at an elevation of seven thousand feet above sea level and is beautifully situ-

ated in the foothills near a range of mountains of the same name. The Governor's Palace, which according to Read was built in 1605, is the most interesting building in the town and is a valuable historic asset. It is a thick walled, one story adobe structure that was the home of governors for centuries and the oldest seat of continuous government anywhere in the United States.

The Palace faces the Plaza on the north and is yet essentially the same building that was originally erected. It was the home of General Lew Wallace while he was Governor of New Mexico and where he wrote the fascinating story of *Ben Hur*. The Palace was recently remodeled and dedicated to science, and it is now the home of the School of American Archæology, the Historical Society and the Museum of New Mexico. It is maintained by the state, and the generous support it receives is an example of modern enterprise that is worthy of emulation by the older states.

Santa Fe, although modernized, retains much of the characteristic flavor and quaintness of an old Mexican town. Many nationalities are represented in the population and numerous languages are spoken, but the Spanish element predominates. It is an exceedingly interesting place, and has a charm that attracts many visitors.

It is also a center of pre-historic civilization, about which very little is yet known, and it was principally for this reason that the town was chosen as the home of the School of American Archæology. Many ruins of ancient cities are found in this vicinity and it is the mission of the school to investigate them, to find out their value and place in aboriginal culture.



Petrified Wood and Clay Beds, Blue Forest



Chalcedony Park

A. F. Bandelier, the noted archæologist, spent many years in studying the early inhabitants of the Southwest, and gathered much valuable information concerning the life of its ancient people. He regarded Santa Fe and the region round about, but particularly a nearby spot known as the Rito de los Frijoles (Little River of the Beans), as an extremely important center of cliff dwellers' culture and the real key to the situation. To popularize his scientific knowledge of the subject, he wrote a romance describing cliff dwelling life entitled "*The Delight Makers.*" This delightful book was published many years ago and copies of the first edition are now scarce and hard to find. It tells of the home life of a primitive people who, after all is said, were not so very different from other folks. Their feelings and thoughts, as told by him, of love, fear, hate, revenge, despair et cetera, were only human traits which will never change materially in any people while the world stands. After referring to various conditions of life, and describing many objects that were found in the deserted cave dwellings in the cliffs, he concluded that the dwellers therein were much the same kind of people as are the present Pueblo Indians of New Mexico.

He says: "It is not surprising that some traditions and myths are preserved today by the Pueblos concerning these cave villages. Thus the Tehua Indians of the pueblo of Santa Clara assert that the artificial grottos of what they call Puye and Shufinne west of their present abodes, were the homes of their ancestors at one time. The Queres of Cochiti, in turn, declare that the tribe to which they belong occupied, many centuries before the first coming of Europeans to New Mexico, the cluster of cave dwellings visible at

this day, although abandoned and in ruins, in that romantic and picturesquely secluded gorge called in the Queres dialect *Tyuonyi* and in Spanish *El Rito de los Frijoles*."

The Rito is certainly a beautiful spot. It is twenty miles directly west of Santa Fe, but is reached by a circuitous route over a long rough road. It consists of a narrow valley which is about six miles long and half a mile wide, and is shut in by high perpendicular cliffs. The glade is narrowest at its upper end, where it is covered by a forest of pine trees; but as the valley descends, the forest becomes more open. A permanent brook of clear water flows through the valley, and thickets of elder, wild cherry, willow and alder bushes grow upon its banks.

Many kinds of wild flowers are in blossom during the year, but the gaillardias and a small native variety of sunflower are the most conspicuous and abundant. These are mostly found in the open spaces among the trees and bloom in the late summer. This large mass of bright yellow petals makes a gorgeous sight, and is in pleasing contrast to the dark green foliage of the pine trees in the arboreal surroundings. It is a quiet retreat that looks peaceful when basking in the sunshine, and is wonderfully calm when the twinkling stars shine out and the mellow moonlight floods the valley.

Santa Fe and the Rito are brought into close relation by the School of American Archæology which has branches in both places. Its offices, lecture rooms and museum are in the city and its summer classes meet at the Rito and Puye in the Pajarito Park for field work and nature study.

The Pajarito Park is an irregular plateau which is



The Painted Desert of the North Forest



Al Stevenson

covered by an open pine forest and has many interesting ruins. It rests upon a thick base of pumice stone, or volcanic tufa, which is a soft friable rock that is easily worked. Where the rock is exposed to the weather, its surface becomes hard, but the interior remains soft. Into this soft rock the cave dwellers delved with their crude implements of hard stone and carved out comfortable homes for themselves. On the ceilings and walls of the room are yet plainly seen the marks of their primitive cutting tools. Some of the caves consist of only a single room but there are other houses that have a number of connecting rooms of different sizes, en suite. They make cozy quarters which are warm, dry and clean—perfectly protected from the cold, wind and rain. It is an effort to reach some of these habitations by climbing up the cliff on a steep trail, but such a trifle did not seem to trouble the cave dwellers in the least, as they were a hardy, active race of people and not easily discouraged.

The cliffs are honeycombed in places by these artificial grottos and must have accommodated colonies of considerable size. The caves are most numerous in the north wall of the Rito, where they have a bright, sunny southern exposure. They are distinctly seen from the floor of the valley in a chain of openings which follow a curving horizontal line just above the talus. Some caves on the talus show the marks where outside houses were attached that have crumbled away. In a few places they are grouped in tiers, one above the other, on the face of the cliff, but these are exceptional.

In a large natural cavern which is two hundred feet above the valley, in a massive cliff that has no talus, was found a large kiva or lodge room, which has been

restored and is called the Ceremonial Cave. At the time of discovery it was inaccessible from every direction, but a path was made, and it is now reached by a series of hand-made steps and ladders. Some of them are so steep that they seem to lean outward from the perpendicular and start shivers of fear in the timid and inexperienced trail climber. Many ruins of communal houses are found on the top of the mesa, far away from any cliff, as well as on the floor of the valley below. They are known to be four hundred years old but may be much older.

Extensive excavations have been made both in the Rito and Puye and they each show the same style of architecture which is of the cavate type. It was once claimed that glazing pottery was an unknown art to the ancient Americans, as no such earthen ware had been found at that time. But this claim proved to be an error, as during recent years much glazed pottery has been discovered in the Southwest, and is now on exhibition in various museums.

The ancient city of Tyuonyi was being excavated at the time of my first visit to the Rito in 1910. It is a large communal house containing several hundred rooms and is located on a commanding site, in the middle of the valley above the brook. It was built in circular form around a central court. Fully five feet of alluvial soil covered the debris, but how it ever got there is a mystery, unless it was an accumulation of dust blown off the mesa by the wind. If this theory is correct, it means that the ruin is very old, as such a deposit of dust from the air is a slow process that would require a long time to complete.

One day while the workmen were digging in the ruins they uncovered a large colony of ants that con-



Governor's Palace, Santa Fé



North Wall of the Rito

tained many specimens of the honey ant. These honey bearers are store houses for accumulating honey dew which the ants milk from their aphis cows. Their abdomens are like rubber bags, that will stretch to enormous proportions according to the amount of honey they are required to hold. They are the commissary for the colony to feed the hungry workers when their ordinary food fails in time of famine. I had read about these ants but had never seen any and found them very interesting.

The School is organized during its summer session into a camp that is composed of teachers, pupils, visitors and Indian helpers. Every related subject is included in the curriculum and is systematically arranged and assigned to the different classes. The students are taught both by didactic lectures and field demonstrations in a course which includes many of the natural sciences and furnishes study and exercise for all who care to participate. In the evening an invitation is extended to the people in camp to gather at the public rendezvous around a big bonfire of dry pine logs. Here they enjoy an impromptu program of social fun and frolic, according to the humor of the audience, which affords an agreeable diversion from the daily routine and makes a fitting close to the activities of the day.

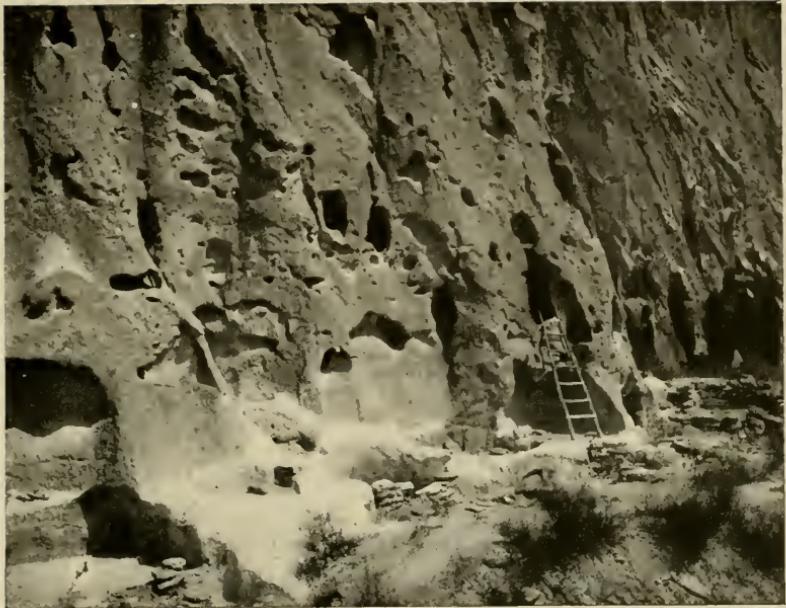
Life in the valley may be somewhat primitive and simple but is all the more interesting and enjoyable on that account. Some sleep in tents, others in the open air in regular camp fashion, while not a few prefer to occupy the ancient houses in the cliffs. Here the writer took up his temporary abode in an empty cave near the trail above the talus. The cave had at one time been the home of a cacique of the Snake Clan,

as was evidenced by the figure of a serpent and other insignia of that order which appeared on the walls. The ceiling was oval and about seven feet high and the room eight feet wide by ten feet long. A large part of the front wall had been broken, and fallen out, which made a wide doorway and gave ample room for light and ventilation. I spread my bed upon the floor and made myself at home.

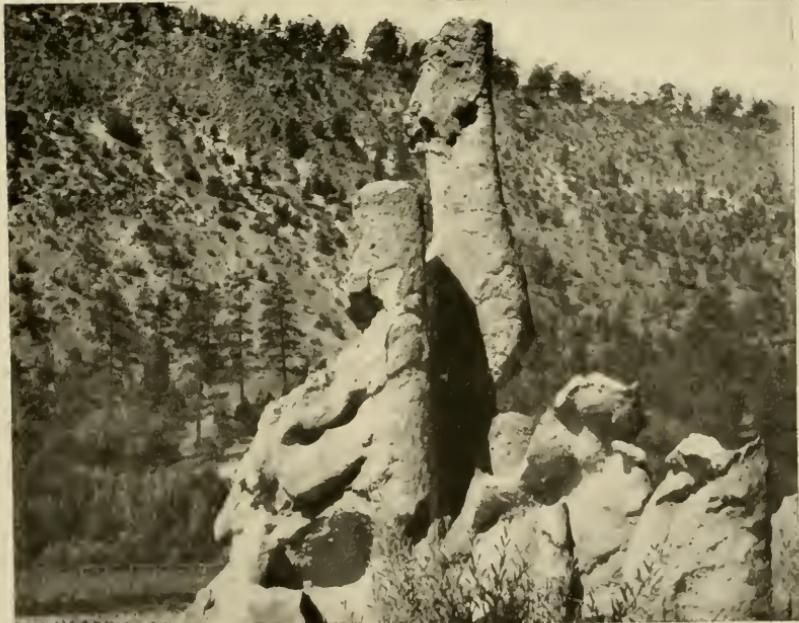
To realize that here on this very spot other human beings had once lived long ages ago, started vague speculations as to what and who they were. Possibly this room was the very home of some of the people whom Bandelier describes so graphically in his story of "The Delight Makers." Any one with an imaginative mind could easily reproduce here the life he depicts in his illuminating novel. I was not long in finding out that just behind the wall, in an adjoining apartment, was a mummy which had been left in exactly the position in which it was found, as an example of ancient sepulture. Its presence was a spooky affair to be sure, but not disturbing in the least, as it did not materialize any evil spirits nor provoke bad dreams.

Taking observations of the surroundings while resting upon my rude couch, I noticed that a colony of wasps had taken possession of a hole in the ceiling and were building their nest. I was careful not to disturb them and they did not molest me. Every morning early, a small canyon wren paid me a visit and flew all about the room unafraid, peering curiously into every nook and corner. Its stay was brief and it soon disappeared.

Every day during my stay had its pleasant surprise but the climax of interest came at the end of the week, when the cliffs on a mile front were illuminated on



Grottos in the North Wall



Prince and Princess of Persia

Saturday night. Soon after dark bonfires were started at intervals along the base of the cliff, and lighted candles were placed in the windows and doors of the cliff houses. It had the appearance of a mammoth play house with the lights and scenery all set and the curtain ready to go up. .

The stage was the open court of the resurrected city of Tyuonyi in front of the cliffs, where an additional bonfire was burning which helped to intensify the general effect. Fifteen Indians who were employed on the ground as laborers were the actors and rendered a program of native songs and dances that were given in a thrilling manner to an interested audience of about fifty white people. The assembly was composed of school attachés and visitors, who found seats upon the broken walls of the ruins, unless they preferred to occupy "standing room." The performance was highly entertaining and received frequent and hearty applause from the small but appreciative audience. The scene was strangely weird and impressive, and something entirely different from anything that had ever happened. It was the event of a lifetime and an experience never to be forgotten.

Throughout the Southwest are found many natural objects of interest that appear to be the handiwork of man. The frescoing and sculpturing of the cliffs by erosion and weather stains where the cliff dwellers made their homes, are striking examples of natural art. Figures of forms and faces are of frequent occurrence that were carved out of solid rock by the silent forces of nature on massive butte and mountain peak. In the Chiricahua Mountains of Arizona is seen in profile the outlines of a noble human head and face looking upwards and silhouetted against the sky. It

can readily be seen by looking southward from a car window of a Southern Pacific train as it speeds westward after leaving Stine's Pass, and is known as San Simon's Head.

Montezuma's Head in the Estrella Mountains on the Gila River in central Arizona, is another striking resemblance to the human features. In this instance the head is held erect in a dignified pose like an Aztec king in whose honor it was named. It is a conspicuous object on the landscape and has been a familiar landmark for centuries.

On the wagon road from Gallup to Saint Michael's, near the Haystacks, may be seen the perfect head of a cow etched in the rock on a cliff where the road passes. It is small and not often seen unless pointed out by some one who knows about it.

By the side of the Tuba road in the Moencopi Wash in northern Arizona is a rock that is almost the perfect image of a camel lying down as if taking a rest. The resemblance is so natural that at a glance the passer-by could easily be deceived into taking it for the reality.

Upon the First Mesa on a ledge of rock half way down the cliff, southwest of Walpi, is the statue of a frog, posed as if ready to jump. The frog is the Hopi's symbol for water, which makes it seem much at home even if it is in a dry country where water is scarce. Whether the Hopis know of this effigy of their water deity is not apparent, but as a natural work of art, it fits perfectly into its peculiar environment and is a striking coincidence.

Quite near the frog and upon the same ledge of rocks is the squat figure of a horned toad, also carved from stone like the frog, that has a perfectly natural



Trio of Snake Dancers



Snake Priestesses

look in its coat of mail and with its horny crest raised as if in anger at being disturbed in the privacy of its solitude. Never having heard of these objects being seen or mentioned, made it seem as if my finding them was a real discovery.

Reference is made to them at this time as similar objects are also found in the Rito, where the cliffs are carved into various curious and fantastic shapes. In front of the cave which I occupied are two designs of unusual interest. One is a double statue composed of two figures in human form, male and female, the man standing and the woman sitting by his side. The striking resemblance to Persian features and costume, gave them the name of the Prince and Princess of Persia. Not far away stands another statue distinctly modeled to resemble the creature described in classical mythology as the Satyr.

My second visit to the Rito was in the summer of 1912 after a long hard trip to the newly discovered cliff dwellings in Laguna Canyon in northern Arizona. I drove out from Santa Fe in a wagon and arrived at the end of the road on the rim of the Rito late in the day. I left my blanket roll in the wagon and climbed down the steep foot trail into the valley. The management is supposed to take care of the baggage and it is usually packed down the trail by the Indian helpers. It happened that on this day the Indians were on a strike and refused to do any work. The situation was reported to the management and a bed was promised that did not materialize; and when I realized that I could get no lodging I recalled my old cave in the cliff, which upon inquiry I found was vacant. I dreaded to sleep without a bed in the cold, as the summer nights at that altitude are decidedly chilly, but there was no

help for it. I procured a tallow candle and some matches from the commissary and picked my way over a dim trail in the dark, to the cave. Having no bed I lay down on the hard stone floor in my clothes, or rather my shirt sleeves, as I used my coat for a pillow. The next morning after I awoke I smiled to myself when I realized what a comfortable night I had spent as I had expected to be frozen stiff before morning.

It reminded me, however, of a night that was passed less comfortably many years ago, while fighting in the trenches under the walls of Fort Negly, during the battle of Nashville in the Civil War. It was in the winter when a terrific sleet storm struck our command and covered everything with a thick coat of ice. Being without cover we lay down upon the ice to sleep, wrapped only in a single thin blanket which froze fast to the ground. In the morning we found ourselves unable to move and could not get up until some more fortunate comrade pulled us loose.

My night's experience in the cave only proved again that everything in life is more or less relative. If I had slept out in the open I would have suffered from the cold. The reason of so much comfort in the cave was because its temperature was the same at all times, and not affected by the outside weather, which fact, in the absence of a thermometer, was easily proved. When I stepped in out of the hot sunshine the cave felt cool, and when I came in out of the cold night, the same temperature was comfortably warm. Thus the things of life are not always what they seem, but are noticeably affected by contrast.



The Mystic Circle



Hopi Girls

CHAPTER VII

ON THE ARIZONA FRONTIER

WHEN the Pilgrim Fathers landed on Plymouth Rock they found a frontier which extended over the entire length of the Atlantic Coast. As years went by the population of the new country increased rapidly and pushed the Atlantic frontier steadily back towards the Rocky Mountains.

Years later, when the Argonauts crossed the mountains on their way to California in search of the new Golden Fleece, they carried the frontier with them and at one bound established it on the shores of the broad Pacific Ocean. There it recoiled and traveled backwards to fill the gap that was made by its rapid flight over the mountains to the western sea. In the course of time the east and west frontiers met in the mountains on the Continental Divide and united to form the last American frontier, that extends from British Columbia to Mexico.

Upon the advanced lines of our growing western civilization the enterprising spirits of the older settlements gathered in search of new discoveries and adventures. What happened during that early period of strenuous and perilous development, in pushing back the frontier of crafty Indians and savage wild beasts, makes one of the most thrilling chapters of United States history; and of that frontier no part of it furnishes a more exciting story than that which embraces the Arizona-New Mexico border.

Here lived some of the most noted tribes of Indians that ever helped to make history. After long years of bloody warfare they were finally subdued and settled on reservations where they now live in peace, trying to learn how to be civilized. Of all the tribes involved, the Apaches were the most fierce and ferocious; but the Utes, Navajos, Comanches and others, also took an active part. It is yet a wild region and unsettled, but has many natural attractions.

In my travels through Arizona I failed to penetrate this region until the year 1901, when I made my first trip to Hopiland to see the snake dance at Walpi. The visit, instead of satisfying me, only increased my desire to see more, and since then I have made many trips to different sections of that country. I was a little late getting started, yet in plenty of time to see something of its primitive state. I had long wanted to see the Apache country, but no favorable opportunity offered until 1905. On one of my visits to Hopiland I stopped at Holbrook to outfit for the trip. While waiting I met Governor Murphy, who arrived from Fort Apache with a party of friends. He gave a glowing account of what he had seen of good climate, beautiful scenery and fine trout fishing in the White Mountains. About that time I also read in the Native American an extract from a letter written by C. W. Crouse, Superintendent of the White River Indian Agency, which said: "If you are a lover of beautiful flowers, pine forests and rugged mountains, come and see me in June or July and I will show you why the Apache loves his home." These reports decided me to delay no longer and I at once began making preparations for a trip to Fort Apache.

We outfitted at our Pinaleño cattle ranch, near Will-



Hopi Woman



Kachina Dancers in Costume

cox, Arizona, in June, 1905. The reason for selecting the summer time was on account of the pleasant weather and long days for travel and sightseeing. Much of the country is at an elevation of from five to eight thousand feet above the sea, at which altitude the weather is cool, even during the hot summer months. The horses and wagon were obtained from the ranch and the vehicle was rigged up with a chuck box, and loaded with bedding, cooking utensils and provisions to last six weeks, during a four hundred mile trip.

Our party consisted of myself and three young men: my nephew from Columbus, Ohio, an embryo doctor from Los Angeles and one of our cowboys from the ranch, who took care of the horses and acted as guide.

A span of big horses was hitched to the wagon, which I drove, and two cow ponies were used for outriders. The saddle horses made side trips where the wagon could not go, and also helped the wagon up steep places by our fastening one end of a rope to the wagon tongue and the other end to the saddle horn for pulling, cowboy fashion.

We left the ranch early in the morning and took the hill road on the San Simon side of the Graham Mountains, for Solomonville, thirty-five miles distant, on the Gila River. All along the road we enjoyed beautiful vistas of valley and mountain scenery, and the balmy atmosphere was pure delight. The desert vegetation was unusually abundant and the pure air was filled with its sweet fragrance.

More kinds of life exist upon the desert than the arid conditions would seem to warrant. At every spring or water hole, which are few, the animals for miles around assemble to quench their thirst. Some animals, however, do not seem to need water, and live in re-

gions where there is none. Prairie dogs, trade rats and jack rabbits are of this class. Neither do they obtain water from the dew or succulent plants, as there is no dew and very little green grass to furnish moisture during most of the year. They are desert bred, have become habituated to their arid environment and thrive on it.

But all birds need water and gather at the springs to get it. Their usual time for going to drink is either in the early morning or late evening. Doves and quail are the most numerous; but the desert has a variety of bird life, and some kinds of birds that are not found elsewhere. They sometimes collect in such large numbers at these rendezvous that when they rise to take their flight their wings make a sound like the noise of a big wind.

Railroad Pass is a favorite resort for Palmer's thrasher, which builds its large cornucopia shaped nest of twigs and grass in some thorny mesquite bush. The cactus wren chooses for its nesting place the fork of a bristling cholla stalk, where it is well protected by a mass of sharp needles that even a fly can scarcely get by. The mother bird often sits on a nearby perch and in her raucous, scolding notes defies the predatory hawk to attack her fledgling brood in their snug and safe nest. The Gila woodpecker carves out a roomy house for itself with its strong beak, from the pulp of a sahuaro tree, and sometimes shares its cozy apartment with the little elf owl.

The road runner is a peculiar bird that got its name from a habit it has of running on the ground instead of flying through the air. It frequents the traveled road and is often seen about the ranches. I tried to locate a nest to see what it looked like, but could not



Sand Dunes and Peach Orchard



A Tempting Snapshot

find one, nor did I hear of anybody who had ever seen one.

I saw my first towhee on one of my early visits to the ranch. I pointed it out to a cowboy before I knew what it was and asked him if he knew its name. He replied, "Oh that's just a little brown bird," and seemed to think that he had fully answered my question.

Jack rabbits and cottontails were very numerous, starting up frequently from the roadside and scurrying off to cover among the rocks and bushes. The western chipmunk is as frisky as its eastern cousin, and where there is no forest in which to hide, makes its home in the chaparral. Small lizards, in many colors, could be seen sunning themselves upon the rocks or darting out of the road to escape being run over.

The desert is indeed a hot dry land with an unquenchable thirst, and the amount of water that is consumed by the traveler is appalling, especially when the liquid supply happens to be running low. The fear of a water shortage causes him to think about it continually, which only tends to increase his thirst. Is it any wonder that the inexperienced tenderfoot who wanders out upon the desert without an adequate supply of water, as he is almost sure to do, being ignorant of desert conditions, should sometimes perish from thirst?

An Arizona sky is always an interesting object, brazen though it be. There is a clearness of the atmosphere that is deceptive and alluring by making distant objects look near. Its lights and shades are in strong contrast and the sky is marked by a variety of brilliant colors. The sky shone with an unusual bright-

ness on the morning that we started on our journey, which was only one glorious example out of many heavenly splendors. As the rays of the rising sun slanted upwards, myriads of fleecy clouds that flecked the sky, sparkled like polished spangles of gold, and the border of a heavy black cloud, which hung low on the horizon, resembled the clear cut skyline of a city, and shone with a dazzling brightness.

We arrived at Solomonville late in the afternoon with banners flying, as the white curtains of our canvas covered wagon flapped gaily in the breeze. When we stopped on a vacant lot to make camp for the night, some small boys of the village came running up, thinking that we were a circus come to town, and wanted admission tickets to the show. When told that we were not a circus, but only ordinary travelers seeking a camp ground for the night, they seemed to be disappointed; and we could not help feeling amused at the ludicrous situation.

The ride down the Gila Valley from Solomonville to San Carlos took two full days of steady driving over a hot and dusty road. There are thousands of acres of rich farming land in this valley that are now under cultivation, and irrigated with water taken from the Gila River by gravity flow. We passed many green meadows of pasture land on which fat horses and cattle were grazing, besides many large fields of waving grain and alfalfa, where only a few years ago nothing grew but cactus, mesquite and greasewood.

Almost at the start, and much to my surprise, I discovered signs of discontent if not actual mutiny in the camp. The young doctor seemed to be displeased with everything that happened. When asked kindly what was wrong he only sulked and made no reply.



Navajo House Maids



Mr. Hubbell and some of his Native Helpers

On the evening of the second day we camped at an empty school house where there was a well of water. I told the young man that it was high time for him to sweeten up and if he did not show any signs of improvement in the morning he would have to leave us, as we could not afford to have the pleasure of the trip spoiled by a surly grouch. The next morning, as there was no change for the better, I gave him a box of crackers and canteen of water and started him down the road towards home on foot. As he went in the direction of the railroad, which was not far off, I knew that he could not get lost; nor would he suffer, as his immediate wants were provided for. I learned afterwards that he reached home in safety, but I never saw him again.

At San Carlos the road leaves the Gila River and strikes off at a right angle towards the mountains. Twelve miles north of San Carlos is the Rice Station Indian School, which is a government institution and, at the time of our visit, was in charge of Doctor J. S. Perkins. We arrived at this oasis on the desert hot and tired, but soon had a comfortable camp made under some cottonwood trees near the school, where we rested and stayed over Sunday. The genial Doctor met us with a smile and extended the glad hand of welcome. He gave us the freedom of the house, a luxurious bath in a real bathtub and a sumptuous dinner, all of which made the strangers feel very happy and at home.

In this vicinity is found the new gem stone called peridot. It is contained in a matrix of black basaltic rock that caps the mesa. As its edge crumbles away the gems are liberated and fall down the cliff to mingle with the debris on the talus below.

From Rice the road leads rapidly into the mountains and rises four thousand feet in the first fifteen miles, winding up from desert heat and aridity to fresh verdure and mountain coolness. It was a surprise to find less wild life in the mountains than we had met upon the desert.

Traveling in the mountains is more strenuous than on the plain, but even if the road was rough in places it was comparatively safe. Farther on, however, the road was badly out of repair and even dangerous where it had been washed out by rains or was obstructed by fallen boulders and landslides. If it had not been for our experienced cowboy guide, who got us out of several tight places, the expedition might have been wrecked and this story never written.

We found plenty of water in the mountains and did not have to make a single dry camp during the entire trip. We drank from some wonderful springs the cool, refreshing draught which is so much prized in a thirsty land; and in some of our camps we were lulled to sleep by the soothing murmur of running water.

After traveling for days up and down hill, on narrow roads and steep grades, weary to the bone, we at last reached the goal of our desire, Fort Apache, the historic home and hunting ground of the Apache Indians. The Fort is located on the White River in a picturesque valley, and surrounded upon all sides by high mountains. It is in the heart of the wilderness on the last American frontier, where a white man is seldom seen, unless he is there on some duty for the government, or exploring expedition of his own.

On such a trip as was ours, where we were cut off from all communication with the outside world, we failed to get the latest news and lost all reckoning of



The San Francisco Mountains



Indian Garden and Lower Bright Angel Trail, Grand Canyon

time; and the strange thing about it was that we scarcely noticed the difference or felt the loss. There were no telegrams nor telephone calls to answer, nor were there any racking noises to disturb the nerves.

We made our camp on White River midway between the Fort and the Agency in a grove of cottonwood trees. The largest of the trees measured twenty-three feet in circumference, or nearly eight feet in diameter. Indians passed by the camp frequently and sometimes stopped to look at the strange white men or to beg something that they wanted. They were always ready to take any proffered gift, but an offer of candy or tobacco, which the Indians dearly love, was not sufficient to make them stand for a picture. As soon as they caught sight of a kodak they would either run away, if they saw any way to escape, or else hide their faces. If any of them became too inquisitive about camp, or outstayed their welcome, it was only necessary to produce a camera to make them go.

The only way that a picture could be taken was by an unexpected snapshot when they were not looking. This was not an easy thing to do as they are keen eyed and always on the watch. For some time it seemed impossible to get any pictures but, fortunately, ration day came around while we were waiting, which afforded the desired opportunity. The Indians came singly and in groups, from every direction, happy and glad to share in Uncle Sam's bounty. While the distribution of provisions and clothing was in progress their interest and excitement was too great for them to notice any little thing like a kodak, and its click no longer had any terrors for poor Lo.

An Apache chief, who lived on Carrizo Creek, was camped with his family at a temporary rancheria in

the brush, not far from us, and was a frequent visitor. He saw me taking pictures but the camera did not seem to disturb him in the least. It was the only instance of fearlessness which I witnessed among the Indians. I asked him one day if I might take a picture of himself and family, to which proposal he readily assented, providing that I pay him one dollar. This I agreed to do and I went with him to his camp to take the picture. The woman and children were very shy and always hid in the presence of a stranger. I waited outside while he went in to bring out his family for the great event, but they refused to show themselves. This angered him so that he stormed and cussed awfully, but it did no good. As he did not demand his money in advance, he lost his dollar, but this sum was made up several times over in various gifts. The Apaches do a little farming by planting some corn, and although it was then the corn planting season, the only field work that we saw done was some desultory hoeing by a few old squaws.

In complexion the Apaches are very swarthy and are of a much darker color than the average Indian. In appearance and intelligence they are inferior to the Hopis, and in their persons and home life are wretchedly dirty. However, this condition may be due to carelessness rather than the fear of water. On our return trip, after leaving the Fort, we saw a crowd of boys and young bucks swimming in the river and having a fine time. The pool was in plain sight of the road where it crosses the river, and reminded me of the old swimming hole in Plum Run, of my boyhood days back east.

The Apache is an entirely different type of Indian from the Hopi, and is hardly fit for such a comparison.



Sunset Mountain and Lava Bed



Sunset Mountain Crater

The Apaches are ignorant and superstitious, like all primitive people, and see signs and wonders in everything. Under the new regime they are rapidly improving and undoubtedly will, in time, make good citizens.

One day I called on the Superintendent, who was busy, with his office full of Indians, trying some minor case of misdemeanor. I waited outside until the trial was concluded, when I was invited in. The atmosphere of Indians in that room, even with all of the doors and windows wide open, was something rank and altogether different from the Indian atmosphere of romance that we read about in books.

While conversing with the Superintendent, a young man entered the room who had just returned home on a vacation after an absence of four years in an Indian School at Phoenix. The change that had taken place in him during that time had made a civilized young man out of a wild Indian and was wonderful. He wore a natty gray cadet uniform and looked very neat and clean. His hair was cut short and smoothly combed, while all wild Indians wear their hair long and tied back from the forehead with a band of cloth or bandana handkerchief. His name was Hoke Smith and he was evidently named after our former Secretary of the Interior. It was the custom, at one time, to give the names of prominent public men to the Indian boys in school. When the presence of the young man became known to the Indians outside, his friends filed into the room to greet their former acquaintance. They appeared to be greatly surprised on seeing him, and stood in open mouthed wonder gazing at the prodigy before them, whom they remembered only as a papoose. They made a great powwow over him,

but the object of their affectionate regard failed to respond to their enthusiasm and sat stolidly in his chair, answering occasionally in monosyllables, professing not to know them—all of which seemed very funny to a mere spectator.

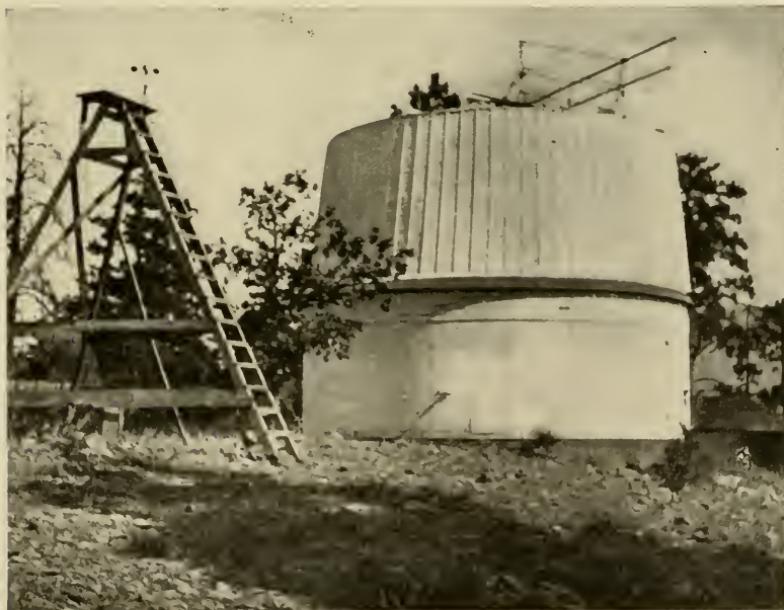
By the river's bank we saw fresh beaver signs in many chips and stumps of trees that had been gnawed off by these industrious creatures, and the trunks and branches used in building their dams. The guide explained that beavers were numerous in the Apache country as the Indians never molested or killed them. They believe that the beaver has the power to control the water supply, and that while he is present in a stream the flow of water will continue, and that when he leaves a stream the water will dry up. They happen to reason from a wrong premise, which has a good result, as, by their mistake, an interesting and useful animal is preserved from extinction.

The guide also told us why the Apaches do not eat fish. The streams in the White Mountains are full of trout but the Indians never catch nor eat them, as their sign propensity and fatal symbolism prevents their doing so. Long years ago a serious epidemic of smallpox broke out among the Apaches and many of them died of the disease. They saw the dead bodies covered with dark spots which they supposed resembled those seen on the speckled trout. The sign at once condemned the fish and marked them as unfit for food. Here again, the Indian's false logic resulted in good by sparing the fish from being caught, until at a later day to furnish sustenance to the white man.

Although the farther end of our journey as originally planned, was reached at Fort Apache, we decided to extend the trip by going fifty miles farther



Volcanic Cones and Cinder Field



Lowell Observatory

up into the mountains to a place called Paradise, so named for its beautiful scenery and fine trout streams.

The first night after breaking camp we stopped in the pine woods at an old sawmill on a clear mountain stream. Some distance beyond this point we passed through a considerable grove of white oak trees, which were the only oak trees that we saw on the trip. The road went by the home of C. E. Cooley, an old time pioneer and Indian scout, who developed a fine farm in the midst of a trackless wilderness. He married an Apache squaw, lived in a comfortable house, and raised an interesting family of half breed children. We were running short of grain for the horses and bought of him a sack of oats at a good price.

All the way from Fort Apache the road led up through primeval forests, with no sign of civilization except the sawmill and Cooley's ranch just mentioned. After leaving the Springerville road the land was all virgin soil, without even a horse's track to mark the trail to our destination in the solitude of the wilderness.

Upon the high plateaus and mountains of northern Arizona is one of the large, unbroken pine forests of the world. Being on government reservations it is protected and still retains its natural beauty and much wild life. In the midst of a grove of aspen trees of this great forest and on the banks of a rushing mountain stream, we pitched our camp. The grazing was excellent, and after their long desert trip of scant water and forage, the horses were manifestly pleased with the change and literally lived in clover.

As soon as we were well settled in camp we got out our fishing tackle and tried our luck in luring members of the finny tribe to an inglorious death. We did not

have a fisherman's fancy equipment of rod, reel, flies and basket, but only a boy's outfit of small hooks and lines tied to poles cut from bushes in the forest. We caught and used for bait grasshoppers in many bright colors that were flying through the tall grass, which imitated perfectly the artificial flies, as with outspread wings they floated on the water. The fish took the bait readily and we pulled them out as fast as we could string them on willow twigs in the old-fashioned style of brook fishing.

Our camp was at an elevation of about nine thousand feet above the sea, where the nights are decidedly chilly. We spent the evenings in front of a wood fire of dry pine logs and enjoyed its genial warmth and cheerful blaze.

The water in the river here is always ice cold and flows in continuous rapids. Pools seldom form except here and there where large rocks or fallen trees lie in the bed of the stream. These objects form eddies of deep water where the trout loves to hide and are favorite spots for casting the hook. It was in the rainy season and thunder showers occurred almost every afternoon, accompanied by vivid lightning and sometimes hail.

The low desert plains of southern Arizona and the high tableland of northern Arizona are like two separate worlds and give to Arizona its diversity of climate, flora and fauna. On the desert and foothills below the five thousand foot level the kingbird and dove were daily visitors at our camp, and always came in pairs. The kingbird is the harbinger of day, and whenever we heard its drowsy twitter in the morning,

“The early pipe of half awakened birds,”



Jollying the Guide



End of the Trail

we knew that dawn was breaking. We lost these birds at the sawmill below Cooley's, on our way up, and after that the robin and bluebird were our daily companions in their stead.

Oh, the lovely pine forests of the high plateau region are charming beyond compare! All the elements of nature seem to conspire to make it an ideal spot. In many places the trees stand close together in dark masses, and again they are scattered about, giving the forest an open, parklike appearance. In the high reaches are many swales and meadows covered with grass and flowers, and bordered by trees that look as if they had been fashioned by the artistic hand of man. How shady and cool are these lovely woods! The smell of pine and sweet fragrance of flowers fill the dreamy air. Blossoms of many varieties are seen on every side, the purple lupine, scarlet pentstemon and white achillea are the most numerous and conspicuous. The woods are vocal with the song of birds, and the flash of bird wings is seen frequently in the sunlight among the trees. Here is the summer home and breeding ground of the robin and bluebird, where they nest and rear their young.

The canyon wren is one of the most interesting birds of the Southwest. It is small, like the eastern house wren, and equally sprightly. It lives in the canyons among the rocks, and peers curiously into every crack and cranny in search of its food. It does a spectacular stunt by making a succession of rapid movements of the body while standing still, that is amusing. When it deigns to sing its song is pure melody. It starts on a high piccolo key and goes tripping down the chromatic scale without skipping a note. After a mo-

ment's pause it repeats the strain one or more times, when it lapses into silence and disappears.

After spending ten days in exploring the woods and trout fishing, we broke camp and began to travel back towards home over the same road we came, as there was none other available that a wagon could travel. Before starting on our trip we had intended to go by way of Clifton and the Blue River road into the mountains, and return by way of the Mogollon Rimrock and the Tonto Basin, but learned that the road was impassable from recent floods, and washouts had made all roads doubtful.

One peculiarity of the trip was that we always seemed to be traveling on an up grade, even when we knew that we were going down hill. This impression may have been partly psychological, but whatever the reason, we felt sure that we were doing more climbing than coasting.

We met a gang of Indians under a white boss, who were working on the road, smoothing the rough surface and making other repairs that were needed. The dangerous fords on the river had been cleared of obstructions, and fallen rocks and landslides removed from the road. The government employs Apaches to do this work on their reservation and pays them each one dollar a day for their labor. The school does its pupils more good by teaching them how to do some useful work of this kind than by giving them only theoretical book learning that they could probably never use.

There was a decided change of temperature after we left the mountains and got back into the hot country in the Gila Valley. We reached San Carlos in the



Keet Seel



Red Rock Canyon Cliff House

evening, but crossed the Gila River before going into camp.

It is an invariable rule in traveling on the desert during the rainy season to always cross a stream before making camp. A fierce rain storm or cloud-burst is liable to occur during the night that may cause a dry wash or river bed to become a raging torrent before morning and prevent crossing for an indefinite time.

We spent the night trying to keep cool, but got little rest. The next day we journeyed up the Gila Valley to Fort Thomas where we spent a second night of heat and discomfort. When the night is insufferably hot, the day temperature in the sunshine can easily be imagined. However, the scorching heat did not seem to disturb the comfort of the wild life in the least, as it was all out and in motion.

It was the quail's breeding season and many groups of young birds were collected in large flocks. The mother bird, who was always on guard, perched on some tree or shrub, kept a sharp lookout for the safety of her young brood which huddled on the ground below. When danger seemed imminent she gave a signal call that sounded like "Quick, git! git!" when they either ran away and hid in the grass and brush, or rose in a body and flew away with a loud whir of wings.

Instead of again traveling the long road around by Solomonville, we took a short cut through Eagle Pass in the Graham Mountains, which led up to higher ground in the Sulphur Spring valley, cool weather and home. There was no well marked wagon road that we could follow, but many cattle trails criss-crossed through the chaparral that were confusing and

misleading. The absence of any good road caused some delay, but we finally managed to pull through over such roads as we could find.

Driving a team of horses and wagon over a long rough road was not such an easy task as it seemed when we started out. Much of the time I had to drive by holding both reins in one hand while with the other hand I clung to the seat to keep from falling off the wagon in going up the steep grades. In going down hill, I worked the brake with one foot, and with the other braced myself on the footboard of the wagon box to preserve my equilibrium and avoid being pitched forward onto the horses. There was something doing every minute and no time to fall asleep. A full day of such strenuous work is fatiguing, but a perfect night's rest made me feel as good as new, and fit for another round. I lost fifteen pounds in weight, on the trip, but I never felt better nor happier in all my life.



Nature's Decorations on Casa Blanca Cliff



Canyon de Chelly

CHAPTER VIII

PASSING OF THE APACHE

OWING to the murders and atrocities enacted by the Indians on the white settlers of Kentucky one hundred years ago, that state was called the Dark and Bloody Ground; but painful as were the experiences of those early days, they were as nothing compared to the deeds of rapine, torture and murder that were committed by the Apaches in Arizona and the Southwest.

The Apaches were first met by the Spaniards in 1540, and were described and named as the Querches by Coronado, and later, as the Vaqueros by Benavides.

The Apache nation belongs to the Athapascan or Tinneh family and consists of many tribes. Prominent among them are the Mimbreños, Chiricahuas, Sierra Blancas, Mescaleros, Jicarillas, Aravaipas and Tontos. Other smaller bands exist within each tribe whose members are united by some bond of mutual interest but who acknowledge no leader except in war time. In private life the warrior is under no restraint and is free to do as he pleases.

The name Apache is comparatively modern and was given by the Mexicans who borrowed it from the Maricopas in whose language it signifies enemy.* The ancestors of the Apaches emigrated from the north and established themselves in their southern home by

* J. G. Bourke, *On the Border with Crook.*

their fighting prowess, which gained them a place in the sun and the fear of their less warlike neighbors. They regard themselves as a superior race of beings and pride themselves on their efficiency in thievery, torture and murder.

The Apache Indian is a fine type of physical development. Many of them are over six feet tall, have a large powerful frame, regular features and an intelligent countenance. The majority, however, are of only medium size, but large chested, full muscled, and built for strength and endurance.

The Apaches were the last of the blanket Indians, and the wildest and hardest to subdue of any of the native tribes. Before they were put on reservations they roamed over mountains and plains. They were the real nomads of the prairies, the Bedouins of the desert, and Ishmaelites whose hands were against every man, and every man's hand was against them. Their field of operations covered a wide territory. It extended from central Texas on the east, to the Rio Colorado on the west and from the Mogollon Mountains in nothern Arizona, far south into the rugged Sierra Madres of Mexico.

They had no fixed habitation and frequently changed their places of abode. Their houses were crude, oval shaped huts called wickiups, made of poles, brush and grass, that afforded an indifferent shelter. Like all Indians, they are natural gluttons and in times of plenty gorged themselves until almost helpless; but when food was scarce they could starve with equal facility and endure a period of famine that was almost incredible. Being desert born and accustomed to drought, they could go a long time without water and not suffer. If pressed by thirst, they placed a pebble



Surprised



Navajo Women Visiting



in the mouth to promote the flow of saliva, or sucked moisture from a piece of green cactus.

Their wants were supplied by native foods with which they were familiar. Deer and antelope were plentiful, and edible fruits and roots grew in abundance. These consisted of the fruit of the giant cactus, prickly pear, Spanish bayonet, mesquite beans, acorns, piñon nuts, wild potatoes, et cetera. The juice of the barrel cactus quenched their thirst if there was no water.

The wild Apache was agile and fleet of foot; he could easily run down and catch a deer in a race. All of his senses were active, and nothing escaped his keen vision. He possessed unusual skill in reading sign and following a trail, and saw much that an untrained white man would fail to notice. If pursued, he covered up his trail so that it could not be followed. When a party of hostiles wished to separate, they scattered without leaving any sign, to meet again, miles away, at some agreed rendezvous. They had great power of endurance and could travel a long distance without a halt or any rest. They moved rapidly, carrying only their weapons, and wearing very few clothes. Their food and water they found by the wayside as they journeyed on. Their mode of travel enabled them to elude any pursuers whose movements were necessarily hampered by their baggage, and a slow moving pack train.

In warfare the aim of the Apache was to see, and not be seen, to kill and not be killed. He was very skillful in concealing his person and could so hide his body in the sand, grass or brush, that his presence was not suspected until he began to shoot. They signaled by means of fire and smoke, or left signs on the trail which

told their comrades of the presence of strangers, where to meet and how to fight.

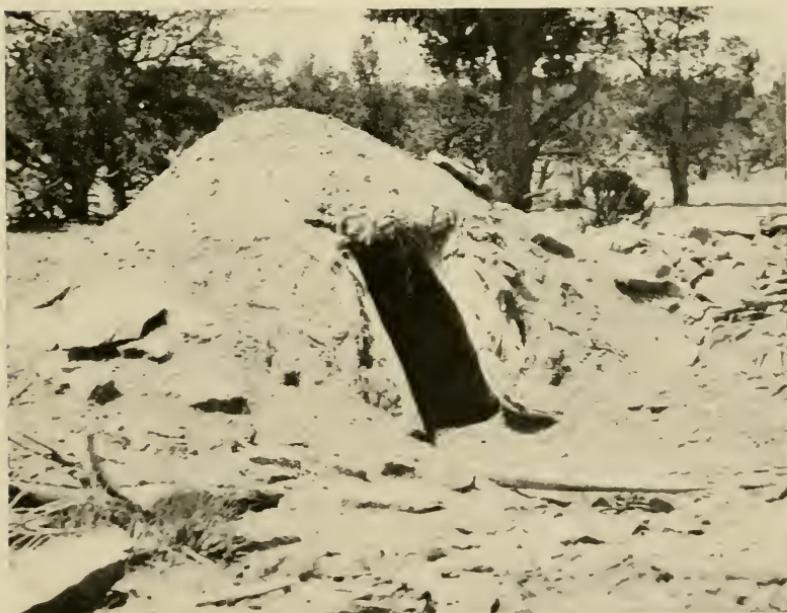
Their custom was to lie in wait for the traveler until he reached some point on the road where he could be successfully ambushed, before making an attack. In traveling through their country numbers usually counted for safety, but did not always mean immunity. A small party of white men who were well armed and on the alert, was less liable to be attacked than a large company of inexperienced and careless stragglers. The Indians who were on the watch immediately discovered the difference and made their signals accordingly. They were never in a hurry, but always took plenty of time to wait for a favorable opportunity to make an attack. The absence of Indian sign did not necessarily mean that there was no danger, as all signs were sometimes purposely obliterated in order to deceive those who might be following on their trail, and the danger was often the greatest when there was no sign in evidence. The old scouts' laconic and lucid advice was: "When you see Apache sign, be keerful, and when you don't see nary sign, be more keerful."

The secrecy and celerity with which the Apaches moved made it altogether uncertain when or where they would strike, or who would be their next victim. The only thing that a white man could do when brought face to face with a hostile was to stand his ground and fight, as he then had an even chance of killing or being killed. It was far better than to surrender and be made a prisoner. That meant slow death by torture.

The Apaches have nothing that can be called religion and no church has ever established a successful mission among them. They are very superstitious



Typical Navajos



Navajo Sweat House

about anything that seems mysterious, and are afraid of the dark, death and evil spirits. They believe in both good and bad spirits, but are not concerned about the former, who cannot do them any harm, but are constantly in fear of the latter, and continually seek to propitiate them. They avoid travelling in the dark or making an attack at night, and abandon or destroy any shelter wherein some one has died. The name of any dead member of the tribe is never mentioned if it can possibly be avoided, and then only in a circumstantial way. They bury their dead in the ground at night, in great secrecy, and Cremony states that no white man ever witnessed an Apache funeral.

Every tribe had its favorite hunting ground and fought its own battles, but its activities were not confined to any particular locality. The Indians spent most of their time on their rancherias, which were located in almost inaccessible places in the mountains, far distant from any white settlement or public route of travel. From these secluded retreats they sallied forth on their thieving and murdering expeditions and had nothing to fear. They were a constant dread and menace to the early settlers of the Southwest, and were feared most by those who knew them best. It has been estimated that no less than ten thousand persons were killed or driven out of Arizona by the Indians in the early days.

The wild Apaches were the most ferocious and implacable of all savages, and have never been surpassed in barbarity and cruelty. They were always the uncompromising foe of progress, and successively and successfully resisted the Spanish, Mexican and American civilization until their final surrender, under Geronimo, to General Miles in 1887.

The Apaches first came into general notice in our country about the time of the Mexican war. They were barely mentioned before that important event by travelers who ventured into their country at different times on tours of adventure and discovery, and were always described as a dangerous foe. Pattie, in his "Personal Narrative," speaks of meeting them at the Santa Rita copper mines in New Mexico as early as 1832, where they were known as the Copper Mine or Warm Spring Indians. After that they were frequently met by government forces who were operating in that country on military affairs, or with some geographical, geological or railroad survey, in an effort to open up the country to settlers, and to mining, agriculture and commercial enterprise.

At first the Indians acted friendly towards their visitors, but soon became hostile and used every means in their power to drive them away. Just when or how the trouble originated is not definitely known. It was likely not due to any one specific act, but the result of a succession of unfriendly deeds committed by different parties at various times which caused their enmity and bloody deeds of reprisal. Cremony, in his "Life Among the Apaches," tells of meeting an old Indian at the Santa Rita copper mines in 1850, who was the only Apache that he ever saw with white hair. He was over six feet tall, had a powerful frame and an imposing presence. As Cremony could speak the Apache language fluently, they soon became great friends and spent many hours together in confidential talks. The Indian said that when he was a young man there were many more of his people than there were then, and that they lived at peace with their neighbors.

After the Santa Fe trappers and traders came into



Moencopi



Shipaulovi

the country, there was a decided change. The strangers sometimes got drunk, became quarrelsome and fought among themselves, killing each other and also occasionally killing an Indian. They mistreated the Indians in every conceivable manner, which conduct naturally was resented. It is even asserted that they were shot and killed out of pure devilment, as if hunting Indians was only sport, like shooting deer. An Indian war followed in which the innocent suffered more than the guilty, as any white man was liable to fall a victim to savage wrath.

The unsettled and dangerous character of the land in early frontier days is indicated by the half humorous description given by J. Ross Browne, of his experience as an artist in the Apache country. "Sketching in Arizona is rather a ticklish pursuit. I shall not readily forget my experience of the cañons and thickets and the queer feelings produced by the slightest sound that fell upon my ears as I hurriedly committed the outlines to paper. It has been my fortune to furnish the world with sketches of Madagascar, Zanzibar, Palestine, the Continent of Europe, Iceland and some other points, many of which were achieved under circumstances of peculiar difficulty; but I never before traveled through a country in which I was compelled to pursue the fine arts with a revolver strapped around my body, a double barreled shotgun lying across my knees, and a half dozen soldiers around with Sharp's carbines keeping guard in the distance. Even with all the safeguards of pistols and soldiers, I am free to admit that on occasions of this kind I frequently looked behind to see how the country appeared in its rear aspect. An artist, with an arrow in his back, may be a very picturesque object to contemplate at

one's leisure; but I would rather draw him on paper than sit for the portrait myself. All the way up from Fort Yuma I was beset by these difficulties; and if any man of genius and enterprise thinks he could do better under the circumstances, he is welcome to try."

The Indians naturally objected to the white man's intrusion into their country and his trespassing upon their land. They considered themselves to be the real owners by prior right of possession, and when attacked, fought bravely in defense of their homes. The white man acted on the doctrine that "might makes right" and proceeded to take what he wanted, usually under the pretense of some treaty, which was broken as often as the occasion required. In like manner the weak of the earth have always had to yield to the power of the strong since the world began.

At the time when the United States acquired ownership of the territory of New Mexico, the Apache country was a veritable *terra incognita*, and little was known of its inhabitants. By the transfer of territory, the government agreed to keep the Apaches from raiding into Mexico to rob and kill its people. The contract proved to be greater than Uncle Sam expected, but was eventually successfully executed.

The Apaches did not fear the Mexicans, whom they held in contempt as an inferior race of people, and did with them about as they pleased. In an attack the men either ran away or were killed, and the women and children were carried off into captivity. Many of the women became the wives of Apache warriors and the children were adopted by the tribe. These forays not only increased the numerical strength of the Indians, but also furnished them many needed horses and cattle that were driven away over hundreds of



Hopi House, Mishongnovi



Captive Eagles

miles of difficult trails. Many of the towns in northern Mexico were enclosed by adobe walls as a protection against the Apaches, but these were of very little service as the people were too cowardly to use them in their own defense. The Apaches had the populace completely terrorized, and whenever the cry of "Los Apaches!" was heard, everybody fled in fear, seeking some hiding place instead of fighting and defending themselves. The Indians took what they wanted and those who were fortunate enough to escape the savage horde, were only too glad to get away alive.

After the Mexican war was over, the Apaches found that they had a different foe to fight. The rush to the California gold fields was on, and the western country began to fill up with eastern settlers. Many of the Argonauts went by the Gila River route, which led through the Apache country, and the Indians found them to be a different class of fighters from the spineless Mexicans. Some of the immigrants stopped in Tucson, while others located on farms and cattle ranches in the Santa Cruz valley, or drifted into the adjacent mountains to prospect for minerals. The Apaches quickly took note of this invasion of their ancestral home, and immediately proceeded to stop the influx of undesirable strangers. The few settlers found it difficult to defend themselves against the Indian marauders. After the troops were ordered back to the Rio Grande during the Civil War, the country was left wholly unprotected, and the few civilians who remained had to make their escape as best they could. The abandonment of the country by the military forces gave the Indians the impression that they were the

cause of the soldiers leaving, which made them all the more bold and daring.

Coloradas Mangas, Cochise and Geronimo were the Apaches' greatest chiefs, and were leaders of unusual force and ability. Among the minor chiefs were Delgadito, Victorio, Juh, Chatto, Nana, Natchez, Bonito and Ponce. Events which led up to the capture of Coloradas Mangas and Cochise—the killing of the former and the escape of the latter—were important factors in starting a long and bloody Apache war. The Indians were accused of deceit and treachery, as if they were the only guilty ones; but these traits of character are common to all people, both savage and civilized, and were practiced in this instance, as usual, by both parties to the controversy.

Some time after active hostilities had actually begun between the Indians and the military, Coloradas Mangas was captured and held a prisoner in an adobe hut. During the night, as he was lying asleep on the floor of the prison, the guard prodded his feet with a hot bayonet. When the chief moved to avoid the annoyance, the guard shot and killed him, making the excuse that he was trying to escape. A statement in McClintock's "History of Arizona" makes it appear that the killing of Mangas was deliberate murder. The officer in command instructed the guard in detail as follows: "Men, that old murderer has got away from every soldier's command, and has left a trail of blood for five hundred miles on the old stage line. I want him dead or alive tomorrow morning—do you understand? I want him dead."

Some time prior to this event Cochise was asked to come in for a conference, under a flag of truce, and was questioned as to charges made against him of aiding



Religious Devotee



Albino Antelope Leader and Snake Priests

in a raid on the Ward ranch. He denied having taken any part in the affair, or having any knowledge of it, and his innocence was afterwards established. Notwithstanding that he was present under the protection of a flag of truce, he was forcibly detained. He cut his way out through the back part of the tent and escaped, but not until after he was seriously wounded. His brother and four other chiefs who were with him, were killed, and their bodies hung on a tree as a warning to other Indians who might incur military displeasure. The Indians had several white men captive whom they offered to give in exchange for the prisoners. Lieutenant Bascom, who was in command and a young inexperienced officer just arrived from the east, foolishly refused the proffer, when the white prisoners were all put to death by torture.

The rank injustice of this affair, together with the killing of Mangas, so enraged Cochise that he swore vengeance on the whites, which dire threat he carried into execution with deadly effect during twelve years of bloody warfare. Up to that time Cochise claimed he had killed Mexicans only, but after what had happened, it would also be war to the knife with the Americans.

When the California volunteers entered Arizona early in the Civil War, they found the country in a very unsettled state. It did not take them long to find the Indians, and they were soon engaged in bloody combats. One of their severest battles was fought in Apache Pass, where a large force of Apaches, under Cochise, was assembled to dispute the road. For a time the result of the engagement seemed doubtful, until the soldiers succeeded in bringing up their cannon into position. A few shots from the big gun was not only a surprise to the Indians, but the bursting

shells in their midst killed and wounded many of them and put the rest to flight. Some of the captured Indians said that they were confident of winning the fight until the "wagon" was fired at them. They had never seen a mounted cannon, and when they saw this one on wheels, took it literally for a wagon, which gave them a new idea of fighting.

To read of the dreadful deeds of the Apaches as told in books written by Cremony, Pumpelly, Browne, Bourke, Humfreville, McClintock and others, is enough to make the heart stop beating and the blood run cold from horror. For fiendish ingenuity in inventing and inflicting the greatest torture, the Apache excelled all the other Indians, and the women even surpassed the men. A common method of torture was to fill the body with cactus thorns that automatically buried themselves deeper in the flesh and had to be cut out, if removed. Another practice was to stake out the victim on the ground, face up, and then start a small fire burning on top of the body until life was extinct. The staking out, however, was preferably done on an ant hill, if one could be found, where the victim was soon tortured to death by millions of ants. For a change the captive was sometimes tied, head down, on a wagon wheel, and a fire started under his head, while the savages yelled and danced about in fiendish glee. These are only a few of the methods used in torturing prisoners; but the absolute ruthlessness of the Apache is contained in the saying, "A coward may kill an enemy but only an Apache has the heart to kill a friend."

Captain Humfreville, in his book, relates the following stories about Cochise and Geronimo. "Cochise was once asked the question if he was sorry for anything he had ever done while out on his numerous



The Enchanted Mesa



Road of Endless Distance

forays. He replied that one day he roped a Mexican, and after stripping him of his clothes, staked him out naked in the hot sun over an ant hill. When the ants began to work up the nostrils and into the mouth and ears of the helpless man, Cochise said that his cries were terrible, and the poor man died a lingering death in great agony. He said on every dark night, when all was quiet, he could hear the groans and screams of the dying man. For that reason he said he was sorry that he had tortured him and wished that he had shot him instead."

Geronimo also tells how he became a chief. "When I was a little boy," he said, "my people made many raids into Mexico. I also noticed that many Apaches were killed and that sometimes a whole war party would be lost. No one could account for this, not even the medicine men.

"The first party I went with made a raid into Mexico and one day we came to a little Mexican village. The Mexicans came out and gave the Indians mescal and most of them got drunk. I did not take any as I thought it was bad medicine. When the drunken Indians were lying and rolling on the ground, the Mexicans came and killed every one of them with knives. I jumped on my horse and went back to my people. Pretty soon I took a war party down to the same place. The Mexicans came out with the mescal just like the first time and my men made believe to be very drunk. Then I gave the signal and we killed every Mexican. This made me a big man and when I went home all the people called me a big chief."

The story of the Indian has often been told by the white man, but the other side of the controversy has seldom been mentioned. What a full blooded Apache,

named Mike Burns, who lives at Fort McDowell, has to say on the subject makes an interesting record. The story is found in volume three of Farish's "History of Arizona" where it appears in print for the first time. He was the only male survivor of the bloody battle of the Cave, in Fish Creek Canyon in Arizona, which was fought in 1872 and graphically described by Captain J. G. Bourke in his book "On the Border with Crook." This spot, where seventy-six dead Indians were found in the cave after the battle, is in plain view, high upon a cliff, on the road to the Roosevelt Dam. During the progress of the fight a little Indian boy, not over four years old, came out of the cave and stood upon the parapet of the cliff, thumb in mouth, looking unscared into the belching gun barrels of the soldiers. He miraculously escaped the storm of bullets and was caught and saved from death by one of the Apache scouts. Captain Burns, the officer in command, took the boy home, sent him to school, and gave him his own name.

During the last years of the Apache war those who surrendered lived on reservations under the care of the government. Chief Geronimo and his band of renegade Chiricahuas were the last to give themselves up. As an aid to their final capture, a company of Apache scouts was enlisted from the various tribes to trail the hostiles, and they rendered excellent service. The scouts did not take kindly to discipline, and were hard to control unless they were permitted to travel in single file, as was their old custom. However, they were loyal and true to their leaders, and did effective work in running down and capturing the hostiles.

The Apache war lasted several years, and cost the nation many lives and much treasure. After their final



The Haystacks



Black Rock

pursuit and surrender at Fort Bowie, Arizona, the Indians were disarmed and marched to Bowie station, on the Southern Pacific railroad. Here they were put on the cars—men, women and children—and taken to Fort Marion, Florida, and later on were moved to Fort Sill, Oklahoma.

The Apaches are now living in peace on their San Carlos and White Mountain reservations, and it is safe to predict that there will never be another Indian war. The fierce Apaches are rapidly becoming civilized—engaged in farming and stock raising, and give every promise of becoming useful and honorable citizens of the nation.

CHAPTER IX

RANCH REMINISCENCES

RANCH life is apt to become monotonous and tiresome if lived too long without a change. It is sometimes regarded as a duplication of farm life, but it is not. Everything is unfamiliar and primitive and while it has its attractions, it also has some discomforts and hardships that have to be endured. Spending a few days on a ranch for pleasure is quite different from living there. The magnet that attracts and compensates for the isolation and loneliness of such a life, is the hope of financial reward in profits derived from the cattle business. Neither is the life all dull monotony, as many things happen to furnish excitement.

It may interest the reader to have related some of the incidents of ranch life that have come under the observation of the writer during the last thirty-five years; and, as some of the experiences are personal, it will also be necessary to mention some names.

My two younger brothers, Edward and William, started a cattle ranch in Railroad Pass in southeastern Arizona in 1882, in which I became a partner in 1884. William was called Bill for short and Edward was known as the Judge, having been elected Judge of Cochise County, Arizona, for two successive terms. Bill started first for the Arizona country to investigate a gold mine on the glowing representations of a friend, but after looking the ground over, he decided



Desert Mirage Lake



Watching the Snake Race
(Note Mirage Effect on the Skyline)

that ranching offered quicker and better returns than mining, and selected a location for a cattle ranch in Railroad Pass.

In this region, at that time, the grass was excellent but the water was scarce, which is the reason that a location was not made sooner. Some surface water was found in several small springs and running streams in the Dos Cabezas Mountains on the south side of the Pass during the wet season, but these mostly dried up after the rains ceased. Wells also were dug in the hope of finding water, but these, too, proved disappointing. However, perseverance had its reward, and after spending some time in exploring the country, a large concealed spring was found on the north side of the Pass, in the foothills of the Pinaleño Mountains. A prospect hole was dug in dry ground but on a promising spot in a clump of willows in Wood Canyon Wash. Here a good flow of excellent water was obtained at a shallow depth, which is the only spring within a radius of ten miles, and one of the best in the country.

Soon after my arrival at the ranch, on my first trip to Arizona in April, 1884, Bill and I rode from our temporary camp on the south side over to our new spring on the north side of the Pass, a distance of twelve miles, to choose a building site and agree on a plan for a ranch house. We camped in a tent, but owing to the Apache troubles we considered it unsafe to sleep there. We took our blankets and made a bed under a spreading juniper tree among the rocks on a hillside overlooking the ranch, where we could see and yet not be seen. Our safety required this precaution as the hostiles were out on the war path and might jump the ranch at any time.

During our stay a lone horseman rode in one day who proved to be a neighboring rancher named George Frisk, and was fully armed after the custom of the country. He claimed that his cattle grazed on the land we occupied and objected to our locating there. He had no title to the land nor owned any water right in that vicinity. We told him that as we had found and developed the spring on the public domain, and had legally located the land as a homestead, it belonged to us and that we proposed to keep it. After some friendly talk he manifested less hostile feeling and rode away mollified. The home ranch is established at this spring which is five miles north of the Southern Pacific Railroad, and fifteen miles northeast from Willcox by the wagon road.

My first visit to the ranch was one of the most pleasant experiences of my life. Everything was new and strange, but full of interest; and the desert attracted me wonderfully. I was so much impressed by what I saw that after my return home to Topeka, Kansas, I hunted for books on Arizona and soon accumulated a number of entertaining volumes. My interest kept pace with my reading, and during the past thirty-five years I have bought every book which I could find that referred in any manner to Arizona. In 1908 I gave my Arizona library to the Southwest Museum in Los Angeles, California, where it is installed in its permanent home in a room of the Caracol Tower. It numbers fully twelve thousand volumes and I am still busy collecting Arizoniana.

Our ranch was criss-crossed by Apache trails in many directions, as it was a part of their old hunting ground. Their main trail into Mexico also crossed the ranch diagonally through Railroad Pass from north-



Resting the Flock



A Desert Outfit

west to southeast. A chain of forts was built on this route that extended from San Carlos on the Gila River to the Mexican border. This road was much traveled before and during the war, and the forts furnished protection alike to soldiers and settlers. After hostilities ceased they were no longer needed, when most of them were abandoned and the trail forsaken. This route was the one followed by General Crook in his pursuit of the renegade Apaches in 1883, and was the trail by which they were returned to their reservation at Fort Apache after their capture in Mexico.

As the Indians had accumulated much live stock and other war material on their raid, their trail, which passed near our ranch house, was littered with worn out and abandoned horses and cattle and other impedimenta.

The question is sometimes asked why we ventured into such a dangerous country to live and do business. To me this act did not seem any more dangerous than enlisting in the army, in which I had had some experience during the Civil War. It was only taking a chance on whom the Indians might kill or capture next. Some one had to take the risk of opening the country to settlement, and the opportunities for establishing a successful business were sufficient to justify the venture.

On my second trip to the ranch in the fall of 1885 my brother-in-law, Valentine Lorentz, an Ohio farmer, met me at Topeka and accompanied me on the trip. As we expected to do some hunting and there was also a good chance of meeting hostile Indians, we both took along our Winchester rifles. My gun was one of the large model forty-five seventy-five variety, that discharged a bottle necked shell. It was a powerful gun

to shoot, but never became a favorite with the ranchmen as it was said to sometimes backfire when the shell exploded, which made it more dangerous at the breech than at the muzzle.

After a few days of horseback riding and looking over the ranch, we planned a trip into the Dos Cabezas Mountains to visit the Fowler and McGregor gold mine, of which we had heard much, and that has since developed into a large copper property. Bill acted as scout and guide, and conducted us over the Gold Gulch Trail which led up into the mountains. We spent a comfortable night at the mine, but the air was full of exciting rumors of Apache raids which were reported as then happening in the vicinity. A woman had been wounded during the day at the Riggs Ranch in Pinery Canyon not far off; all of the horses for use in the fall roundup had been stolen from the Chiricahua Cattle Company's corral at the Sulphur Spring Ranch during the previous night; and Mike Noonan had been shot dead in the early morning at his home in the Sulphur Spring Valley. This startling news caused us some concern as to our safety on the return trip, as it was never certain where the Indians would strike next. We started home in the early afternoon by a short cut down East Canyon without seeing any Indians, but expecting to meet them any minute. I had the good luck to kill a young deer on the trail which I packed home on my horse, that made an acceptable addition to the ranch larder.

We heard nothing more of the Indians, but noticed after reaching home that Mr. Lorentz's countenance wore an unusually serious expression. Nothing special developed, however, until the next day when he surprised us by asking if he could be taken to the rail-



Hieroglyphics Near Adamana



The Sky Army

road station as he wanted to go home. Bill said that it was impossible for him to go that day, but that if he must go he would take him to Bowie Station in the morning. The scare stories which he had heard unnerved him, and he regarded his wife and children at home of more importance than the Apaches and was impatient to start back at once.

After a few days of routine at the ranch, Bill and I decided that we would visit some neighboring ranches in the upper Sulphur Spring and Aravaipa Valleys, and learn more about the doings of the Apaches.

Ten miles west of us, George Judd, a boyhood friend, who had also caught the western fever, had started a new ranch, and he was the first on our visiting list. As we approached his cabin we caught sight of him before he saw us, chopping and hauling firewood. We stepped out of sight behind some big rocks and agreed to give him a scare. We gave a blood curdling Apache war whoop and watched to see its effect. His only weapon was an ax, but he bravely stood his ground, ready to meet any threatening danger. Not to keep him long in suspense we stepped out again into the open, where he could see us, and began to laugh and wave our arms to attract his attention. He recognized us at once, and when we met, we complimented him on his courage. He said when he heard our yell he felt sure the Apaches had him and was much relieved when he found himself with friends. He admitted that the experience had taught him a lesson, never again to leave the house without his gun.

Together we went to the house, where we found a half dozen men who had met there for self defense should the Indians make an attack. They had a little black dog which they called Geronimo, that the hostiles

had lost while on the march, too footsore to travel any farther. There were plenty of Indian signs about but none very fresh, which indicated that the Apaches had already passed by and gone on into Mexico. Later we heard that on their way out they had killed two miners not far from Willecox, who were traveling the public road going to their mine in the mountains.

Supper was soon ready and eaten in camp style, after which preparations were made for spending the night. We decided to sleep in the house, which was a one room board shack with all of its cracks, doors and windows open. The rude home-made table and benches were soon carried out and our blankets spread upon the bare floor, foot to foot, and heads against the wall, which about covered all the floor space. After lying down, visiting began in earnest by each one contributing his share of news, and between the stories told and pranks played, it was late in the night before we went to sleep.

The next morning after breakfast we bade our genial host and jolly companions good-by and rode on up the valley to the Sierra Bonita Ranch, which was located and established by Colonel H. C. Hooker in 1873. The Colonel went into that country from New England as a government contractor to furnish beef to the frontier army. He was engaged in this work for many years while his ranch was growing into one of the show places of Arizona. From Hooker's we pushed on to the Eureka Springs Ranch in the Aravaipa Canyon, which is a continuation of the Sulphur Spring Valley, but with its water shed running in the opposite direction. At their junction is an extensive area covered by smooth grassgrown rolling hills, that resemble the fixed waves of a billowy sea. We were joined in the



Marsh Pass



Agathla Butte and Comb Ridge

ride by a Mr. W. H. Breckenridge, an old timer, who had many thrilling tales to tell about the Indians. Under the panicky circumstances our excited imaginations could almost see skulking savages flitting about in the evening shadows, and made every cactus stalk look like an Apache lance and every yucca plume appear like a feathered scalp lock.

The Eureka Ranch, at the time of our visit, was owned by the Leitch Brothers but has changed hands several times since. It is one of the best ranches in the state of Arizona and controls many miles of fine grazing land. Its herds of fat cattle feeding on seemingly endless meadows of rich gramma grass was a pleasing sight. On one of our rides over the hills we caught sight of a herd of antelope feeding on a hill-side and immediately gave chase. I took a long shot at the leader with my Winchester, which evidently hit him, but did not stop his running. Bill then took after him alone and after running some distance got near enough to bring him down with a shot from his revolver. An examination revealed that my shot had broken one of his forelegs above the knee, yet the effect scarcely checked his speed. I took the head home and had it mounted, and it is now hanging in the room of the Arizona Library with other local trophies of the chase.

In the fall of 1887 a party of six Topeka friends made a trip to California by the southern route and planned to stop over at the ranch. The party consisted of the writer, his wife and sister, Mr. and Mrs. G. B. Palmer and son, Paul. Although the renegade Apaches had surrendered recently, it was not certain that all had returned to the reservation, which made

it risky for women and children to venture into the wild haunts of the hostiles.

We detrained at Willeox where the Judge met us and took us by buckboard conveyance, in two vehicles, over fifteen miles of good wagon road to the ranch. The ranch house at that time contained only two rooms, which were too small to accommodate the company, and tents were pitched to receive the overflow. The women and children occupied the "spare room" and the other room served as kitchen and dining room. The tents furnished sleeping quarters for the men. The peace and quiet of the wilderness was enjoyed by all; but there was apprehension of possible danger from the Indians. Naturally the women felt nervous and made frequent trips to the window to see if any Indians were actually coming, but luckily for us none appeared.

The men took frequent horseback rides over the hills in search of game during the day, but with little success, and seemed to have better luck hunting at night. Folding cots stood at the sides of the tent leaving the flap entrance open. Coyotes frequented the neighborhood and were often heard in shrill serenades as they prowled in the vicinity of the camp during the night. At times they became bold and approached very near, but paid dearly for their temerity by coming once too often. One night when the moon was shining brightly, they were more noisy than usual, and Mr. Palmer got up in pajamas, and with his trusty double barreled shotgun in hand, sallied forth into the open and soon laid two of the varmints low. Next morning they were brought in and skinned, and later on their pelts were made into handsome rugs. Many other small varmints like cats, skunks, trade rats, etc.,



Laguna Canyon



Wetherill's Pack Mules, Annie and Red

infested the camp and caused some disturbance but did no particular damage.

Not many nights, after this experience the same gang of noisy coyotes was heard prowling about the premises. Being out early in the morning looking for game, I caught sight of them and, taking quick aim, blazed away into the bunch. The shot dropped one of the coyotes as if it were dead, and I threw the rifle over my shoulder and started to pick it up. I had taken but a few steps forward when the corpse began to kick and bounce about like a chicken with its head cut off. Its erratic movements soon ceased and crawling to its feet and looking about, it started to run away. Its movements at first were weak and wabbly, but it gained strength and speed as it ran, and soon disappeared over a ridge. I was so interested in watching its antics that I forgot to shoot again until it was too late. The bullet failed to reach a vital spot but apparently creased the skull and shocked the brain enough to produce temporary paralysis.

My cot stood at the entrance of the tent with my head near the door when lying down, and here I met another unusual adventure. One night I was awakened suddenly by something jerking vigorously at my pillow. I could not imagine what it meant but remained quiet and awaited further developments. The thing was soon repeated, when I raised up, turned my head quickly and saw standing in the doorway near my pillow a tall slender bird like a stork. After a few moments of mutual surprise the bird turned about, ducked low, and flew swiftly out into the night. It was evident that Doctor Stork was looking for a patient but made the mistake of his life by calling at the wrong house.

While in California I bought a lot of fruit trees, which, on my return trip in the spring of 1888, I planted in a fenced inclosure below the spring where they could be irrigated. Although they received but little attention after I left the place, they grew even better than was expected and have since yielded much fine fruit. These trees seemed destined to have a mission, as their products have been displayed in various exhibits, during recent years, to show the horticultural possibilities of Arizona.

Just before our leaving the ranch for home, Charles Graves, one of the cowboys, mentioned that he had seen deer signs in the vicinity and said he believed that we could get one if we went after it. This we decided to do and were not slow in getting started. We mounted our horses and rode off in the direction of Dos Cabezas Mountains. We had not gone far until Charlie intimated that he saw two deer resting in the shade of a live oak tree on Maverick Mountain across the valley. By his direction I was able to locate them, but they did not look any bigger than kittens. As the quarry was at rest and likely to remain quiet for some time, he advised riding farther up the valley and out of sight before starting to stalk them. We left our horses at the foot of the mountain with the bridle reins trailing over their heads, which is the cowboy's method of hitching his mount, and proceeded to climb on foot. Cautiously peering over a little ridge on a shoulder of the mountain where we had them located, we saw the deer within easy shooting distance. In an instant Charlie's gun rang out and the shot dropped one of the deer, when its mate ran one hundred yards down the mountain side and stopped, looking back to see what had become of its companion. I was pre-

pared for any event and immediately aimed a plunging shot off hand, when it also toppled over dead. We each carried a deer down to where we had left our horses, loaded them up and rode home. The women at the ranch house had heard the shots and had seen the smoke from our guns; and in less than an hour after leaving the house we were back home, each of us with a deer on his saddle.

My annual visits to the ranch up to 1891 consumed from four to six weeks each, but that was not enough time in which to see everything. That year I arranged my affairs to stay six months, or during the entire summer, and I never spent a more interesting or enjoyable vacation. I saw all phases of ranch life and was not pressed for time, nor did I have to feel in a hurry to go.

I was often alone on the ranch several days at a time when the crew of cowboys were away on the range or busy at a roundup. Then I had to cook my own meals or go hungry. I cultivated a vegetable garden as an experiment, which proved a great success and added a variety of new dishes to the daily menu. The cucumbers were particularly choice and I found them to be a desirable and wholesome fruit. A cucumber sliced thin and seasoned to suit the taste with a dash each of salt, sugar, vinegar and water, makes a fine salad and, combined with bread and meat, constitutes a full and satisfactory meal.

Watermelons also grew to perfection and served the double purpose of meat and drink. A plump thirty or forty pound melon crisp and sweet off the vine, in the cool early morning, often furnished three square meals a day and fully satisfied the cravings of nature. The Rattlesnake was a favorite brand, but the Cuban Queen

was also in demand on account of its size, one of them often weighing from seventy to eighty pounds. Other vegetables such as beans, tomatoes, potatoes, corn, etc., were also grown, so that I could truthfully say I lived off the fat of the land.

I soon discovered that the average cowboy is no farmer and will seldom do any work which he considers does not belong to his profession. I could not get them to do any kind of garden work, but I noticed that they were always ready to partake of its fruits whenever they were cooked and served in savory dishes on the table.

The ranch had few callers and only rarely did a stranger stop to ask for information or to obtain a supply of water for his horses and wagon. The country is too sparsely settled and the distance between ranches too great to make travelers numerous. The most frequent visitors on a ranch are the chuck line riders. They are the incompetents among the cowboys who cannot hold down a job. Having no ambition or steady employment, they drift from ranch to ranch and live on the generosity of the owners. These uninvited guests often become a nuisance but are tolerated because cowmen are generous and do not wish to give offense. The hobos of the range are apt to exaggerate any real or imaginary mistreatment, and are always ready to repeat their grievance to any who will listen, and in this manner they often misrepresent affairs and prejudice neighbors against one another.

Doctor J. A. Bright, the Willcox druggist, made repeated promises to visit us, but not until the summer was nearly spent did he put in an appearance, when a young man named Billy Lumpkins and I were the sole occupants of the ranch. He gave us a great surprise

when he called in the night after everybody was in bed and asleep. The Doctor left town that afternoon in a buggy, in good time to make the trip, and expected to reach the ranch before dark, but he missed the road and was late in arriving. I was glad to see him even if he did come at an inopportune time when the ranch larder was low and the flour bin almost empty. Knowing that he was hungry I got busy hunting something to eat. Fortunately there was a remnant of boiled beef and beans in the dinner pot, which was soon warmed up and set before the hungry guest. There was not a bite of bread in the house, and only one cup of flour in the sack, which was being held in reserve for breakfast; but I at once proceeded to make it into a loaf of ranch bread, remarking as I put it into the oven that supper would soon be ready. The guest ate heartily of the beef and beans and forgot about the bread, which I also purposely failed to mention again, so that it was saved for breakfast as originally intended.

Any one not informed would never have detected the innocent deception nor the deplorable state of the larder had not another unexpected event happened later in the forenoon. The Judge dropped in on one of his unannounced visits and went straight to the cupboard to get something to eat, as he was always hungry. Not finding anything, he wanted to know why the empty cupboard? Billy spoke up and said that everything eatable in the house had been consumed at breakfast, and that not a bite could be had until the ranch wagon, which was about due, would arrive from town with a load of fresh supplies. When the Doctor, who sat near and heard the conversation, sized up the situation he could not suppress a smile, and passed it

as a good joke. If only the inquisitive Judge had kept out of the cupboard and said nothing, the deception would not have been exposed.

One night towards morning we were awakened out of a sound sleep by a most unearthly noise. In our half awakened state it sounded like the Crack of Doom and seemed more like a nightmare than anything real. It seemed to be a combination of running horses, cracking timbers and the roar of a mighty wind. By the time we reached the door the storm had passed and the night was quiet. We wondered what had happened to make such a fuss and studied whether we were awake or only dreaming. We lay down again, were soon asleep and knew nothing more until morning.

After we got up we found a young man from town standing at the door, who explained the cause of the commotion. He had been sent out in haste during the night by the local physician to find me, as he wanted to see me in consultation in a desperate case of sickness that he was treating. The boy drove a span of young horses in a light wagon and traveled fast as he was in a hurry. He managed to keep in the road in the dark until he came near the ranch where it disappeared in a maze of cattle trails that led to water. This confused him and switched him off the road onto a trail which descended abruptly into a ravine. Team, wagon and driver went over the cliff together, which frightened the horses so that they ran away. They raced by the house through heavy mesquite brush and scattered pieces of the broken wagon and harness in every direction. The driver followed on foot, but did not catch the horses until morning. After breakfast a ranch conveyance was provided which took us to town in quick time. The patient, however, proved to

be a hopeless case and died the same day. My nerves were somewhat shaken by the unusual episode and I was thankful that the like of it did not happen every day.

In 1892 I moved from Topeka, Kansas, to Los Angeles, California, to live, and on my way out made my annual visit to the ranch. It was the first serious drought that the ranch had experienced and the cattle looked rough and thin from lack of feed. The air was also unusually dry and electrical, which made everybody feel irritable and unhappy. The conditions were unattractive and I did not stay long but hurried on to the coast, to return later when the situation was improved.

After the year nineteen hundred I did not make such frequent visits to the ranch but spent most of my vacations in traveling over northern Arizona, seeing its many natural wonders, which were mostly new to me. By thus seeing all parts of Arizona I found out what a great country it is and the extent of its varied resources.

Late in the autumn of 1904 Doctor B. F. Beazell of Pittsburgh, Pa., met me at the ranch to spend the holidays. As Christmas approached the cowboys informed us that they were going home to see the folks, which meant that we would have to run the ranch without help while they were away. We decided to celebrate Christmas by preparing a big dinner and enjoying ourselves. As the responsibility of the affair rested on me, I made plans for the dinner and started in by getting a pot of beef ready to boil. Doctor Beazell said that he was hungry for soup and would show me how to make it, to which offer I gave my consent as he seemed to be sure of his culinary ability. He

began the process by pouring a pint of rice and a quart of beans into the pot with the beef. As I had had some experience in soup-making myself, I anticipated that something extraordinary might happen. I excused myself and took a walk over the hills. After some time had elapsed I returned to the house and found the Doctor very busy with the miraculous increase of rice and beans in the kettle. Instead of dipping out hot soup as he had planned to do, he was kept on the jump disposing of the surplus rice and beans until he had filled nearly every empty vessel in the house. After getting matters regulated we settled down and enjoyed the rest of the day with a good dinner and a hearty laugh over our adventure. By some means the news of our wonderful dinner spread among the neighboring ranches and afforded some amusement to the cowboys, who always make the most of every trifle for their own amusement; and the incident is even yet referred to in a quiet chuckle.

In the summer of 1905, while I was at the ranch getting ready to go to the White Mountains, I chanced to meet the eminent naturalist, John Muir, in Willecox. He said that he had come there hoping to benefit his daughter's health and to get first hand information of the desert and the many attractive features of the Arizona country. He was stopping at the Sierra Bonita Ranch with Colonel Hooker, where he found good accommodations. Subsequently Colonel Hooker told me about Mr. Muir's visit and said that he found him to be an agreeable gentleman and a guest who was not hard to please. My book of Arizona Sketches was just out and the Colonel had several copies in his house. In the morning after breakfast Mr. Muir would

put a copy of the book under his arm and with his daughter wander off towards a grove of shade trees down by the lake and would not be seen again until evening. Mr. Muir was not only a keen and careful observer of nature but also had the happy faculty of telling the story in books in a fascinating manner.

Returning from an eastern trip in 1906, I could not refrain from stopping at the ranch again for a few days' outing. Although I had not ridden horseback for years, on leaving the ranch I rode fifteen miles to the railroad station at the head of a bunch of cowboys, without a halt, and did not feel a bit tired. We did not shoot up the town cowboy fashion as we might have done, but people whom we passed on the road looked surprised, as if uncertain as to what our intentions might be; but we were not the desperadoes that our rough appearance indicated.

Not one of my many trips to the ranch was made without something strange happening, but they are not all recorded in this chapter. Even as late as 1916 when the country had filled up with settlers and become civilized, I saw sights just as startling as any that had preceded them. While the Judge and I were driving out of Willecox in a buggy we saw a strange looking object approaching us in the road. As we came nearer we saw that it was two young men carrying a board on their shoulders, upon which rested the dead body of a little girl covered with light drapery. The sight was so unexpected and sad that we instinctively drove slowly by in silence. After passing them a short distance we also met the family walking in the road. We stopped and spoke to the mother who informed us they were taking the dead body of their little daugh-

ter from Glade, a switch station on the railroad, to bury her in the Willcox graveyard where she would have company. They were Mexicans and apparently too poor to afford a funeral cortege.

CHAPTER X

BIG IRRIGATION PROJECTS

IN the arid Southwest the natural rainfall is not sufficient to grow and mature cereal crops. The country has a fine climate, soil and scenery, but very little water, though when enough can be developed for irrigation, it is capable of making a Paradise.

When water is applied to land artificially by irrigation, it is superior to rain, as it can be regulated and used in such quantities as may be desired. Rain is always irregular—is apt to be either too much or too little, and only seldom just right for the needs of the growing crops. Much damage is also done by floods in the rainy season; but the failure of crops is more commonly due to a protracted drought.

The soil of the Southwest is more fertile than it is in the east because it contains important chemical salts that are necessary to plant growth. In a country where it rains frequently these salts are leached out of the soil and lost to agriculture. Sometimes they are present in excess, when they become injurious by making the soil alkaline, which is a condition that is difficult to correct.

The arid Southwest was settled and cultivated by an agricultural people long before it was occupied by the white man. Many ancient ruins of buildings and irrigating ditches are found which show that the country was once densely populated and productive. In the

Salt and Gila River valleys are many such ruins; and old irrigating ditches that run on perfect geodetic lines are yet being used for conveying water to modern cultivated fields.

In the unfenced pastures of the western country during the early days, the original locator of land had the vast public domain to choose from and he was practically lord of all he surveyed. Those days are past, as most of the wild land has been located, and but few opportunities remain for making desirable entries under the general land laws. Making a location, however, is only the first step in acquiring title to government land and even though the land costs but little, it is of small value for any purpose without water.

There are comparatively few places in that vast region where water is found in running streams, springs or wells. Although it is sometimes struck at a great depth, as a general rule it cannot be obtained at any depth by digging. It is a dry land and looks bleak and barren except during the short rainy season when the grass grows and the country looks green. Without some permanent water for house use, no home can be established and growing anything is simply out of the question.

The original entry fee for such a piece of land is but a trifle compared to the cost of its improvement. There is considerable expense attached to getting the land into shape and ready for planting. It is ordinarily more than one man's job and requires large capital and co-operation to make it a success. The ground has to be cleared and leveled, ditches dug and kept in order and large reservoirs built for storing a permanent supply of water. Starting life in a new country is not all joy, and many hardships and privations have

to be endured. Everything is new and has to be tried out as to possibilities and values. It requires pluck, patience and perseverance to bring success, and make the land productive and profitable, which is no small undertaking in any case.

Dry farming is being employed to some extent and has been found helpful, but it is a new method and not yet fully developed. If diligently practiced under favorable conditions it is of much benefit, but when the soil is not well stored with moisture in advance, it is of but little value.

In recent years various private enterprises have been started for irrigating desert land, yet for some reason they have nearly all failed. The government was finally asked to help and has given valuable assistance. Through the Reclamation Service expert engineers and large sums of money were furnished which made it possible to finance big irrigation projects. Some of these projects have already been completed and are now in successful operation and others are being planned. They have been the means of establishing many new homes in farming communities on a permanent and prosperous basis. The estimated average cost of getting the land ready for cultivation is about one hundred dollars per acre. By the governmental method the investor is protected in his purchase by getting long time and easy payments, which gives him a chance to win out. The purchaser can acquire title to only a limited amount of land, one hundred and sixty acres or less, which prevents the land being monopolized and owned by a few men for speculative uses. The purpose of the plan is to secure small homes for many people, who can till the soil under favorable conditions, which benefits both the individual

and the community. From the patrons of each project is organized a water users' association which manages the distribution of water under government control.

The newest of these projects, and only recently finished, is the Elephant Butte Dam on the Rio Grande in New Mexico. It is a storage reservoir of immense size that has four times the capacity of the Assuan Dam on the river Nile in Egypt and is twice the size of the Roosevelt Dam on the Salt River in Arizona. It is said to be the largest reservoir in the world. Its cost was ten million dollars and it is capable of serving three hundred thousand acres of land in the United States and Mexico.

The Rio Grande Valley has given in past times the longest agricultural service of any region in the United States. Farming and stock raising have been practiced ever since its first occupation by the Spaniards in 1540, and it was farmed before by the Pueblo Indians from time immemorial.

Soon after the United States took possession of New Mexico in 1848, hardy pioneers from the east began to search that region for new homes. Among the first places to attract attention was the Salt River Valley in central Arizona, but owing to its remoteness from civilization and frequent incursions by the Apaches, its progress was slow and it did not really begin to develop until the year 1868. Since that time the improvements have been steady and its present wealth fully justifies the wisdom of its early choice. The charm of this beautiful green oasis on the desert is accentuated by its barren surroundings and it has become one of the show places of Arizona. It is a prosperous agricultural and horticultural region and is settled by an industrious and enterprising people.

The natural water supply of the Salt River Valley is more abundant than is common in a desert country. Many small streams, that are called rivers on the map, flow out of the mountains and furnish plenty of water for a season, but the frequent dry spells cause the streams to diminish to such an extent that the flow of water often fails entirely at a critical time when it is most needed and the growing crops are ruined. The uncertainty of getting a harvest discouraged the farmers from tilling the soil and development work almost ceased. The Roosevelt Dam was then planned and built to correct the water deficit and to furnish an ample supply for all time. In this immense reservoir, the run-off from an extensive watershed is collected and used in irrigating the fertile fields of the valley whenever water is needed, which makes its agriculture absolutely secure. The dam is located in a mountain region of much wild beauty and is rapidly becoming an attractive health and pleasure resort.

Another region of great interest and importance is the Yuma country on the lower Colorado River. Here the river banks are low and subject to overflow when the water is high, and the loose sandy soil is not suited for dam and bridge building. Yuma is the only place on the river for many miles where the banks are rocky and sufficiently firm to make a safe crossing. In the early days all overland travel to the Pacific Ocean by the southern route crossed the Colorado River at Yuma. A crude flat boat was first used, after which a rope ferry was established; then the Southern Pacific Railroad bridge was built and only recently has a substantial wagon and automobile bridge been finished. This road was attractive to the immigrant as it avoided the high mountains and snow that had to be

encountered in the north. Notwithstanding the scarcity of water and the hardships of the trip, fully eight thousand immigrants crossed the Colorado Desert during the first ten years of the California gold rush. Yuma is also the head of sea navigation on the Gulf of California and was the distributing point for travel and commerce to the interior parts of Arizona before the railroad was built.

The land of the Colorado River Valley is very rich, and when water is applied to the soil by irrigation it yields heavy crops. No dependence can be put in the rainfall, as the annual precipitation is less than three inches. How to get water out of the river onto the land was a problem, as there was no suitable place for building a rock bottom dam and the cost of pumping made it prohibitive. The engineers who had the work in charge finally decided that a dam of the weir type, which did not require bed rock, could be successfully installed. The Laguna Dam was then built which raises the water in the river bed high enough to cause it to run through lateral canals without interfering materially with the channel flow. By this means water is brought by gravity flow on to the bottom lands below Yuma, where a highly productive agricultural district has been developed.

Before the Laguna Dam was begun, one of the largest private irrigating enterprises ever conceived was organized to reclaim the waste lands of the Colorado Desert. Professor William P. Blake, the distinguished geologist and mining engineer, while employed by the government surveying routes for a Pacific railroad, was the first man to explain the origin of the Salton Sink and to trace its ancient history. He was also first to suggest the possibility of irrigating it

and predicted that when it should thus be supplied with water from the Colorado River, its soil would "yield crops of most any kind." He had the imagination of an investigator coupled with the accurate knowledge of a scientist, and could see that the sedimentary deposits in that ancient sea basin needed only water to make them fertile.*

In 1891 a corporation was formed and named The California Irrigation Company, for the purpose of carrying water from the Colorado River into the Salton Sink. For various reasons the enterprise failed, but was reorganized in 1896 as The California Development Company. Slowly the difficulties in the way of its progress were overcome and in 1900 the company got fairly upon its feet and started on its career of usefulness. In that year actual work was begun by cutting the low bank of the Colorado River nearly opposite Yuma, and digging canals and ditches for conveying water to thousands of acres of irrigable land. About that time the first settler arrived in the valley and colonists from every direction commenced to flock in. It was decided that the name of Colorado Desert was too suggestive of aridity and failure for an irrigating enterprise, and in its stead the new name of Imperial Valley was adopted as being more alluring to the home seeker. The company had many tribulations and difficult problems to solve as it was a pioneer in its field. The scheme made no money for its original promoters, but the big paying crops that are now being gathered makes the land in the Imperial Valley very remunerative to the farmer. Water on desert land has developed a fertility and productiveness that is almost beyond belief. The desert is a great store-

**The Salton Sea*, by George Kennan.

house of potential wealth and its producing capacity seems to be unlimited.

Centuries ago the Gulf of California extended more than one hundred miles farther north, and its ancient beaches and shore line can yet be traced in many places upon the mountain side. As the heavy sediment from the murky waters of the Colorado River settled and accumulated in the quiet waters of the Gulf, an extensive delta of alluvial soil was built up into a large body of dry land, which eventually reached across the gulf to the coast of Lower California. The newly made land thus cut off a large arm of the sea, from which basin the water gradually evaporated and left a deep depression that is approximately three hundred feet below the level of the sea and is known as the Salton Sink.

The lower Colorado River, after the fashion of western rivers, runs upon a dyke that was made by a deposit of silt upon its bottom which raised the river bed to an elevation above the level of the surrounding plain. This peculiarity of stream formation in the west causes low banks and frequent overflows. Other streams have a habit of losing themselves and running empty for a season, when the water sinks into the sand and flows in subterranean channels, appearing and disappearing at irregular intervals until they lose themselves entirely on the desert, like the Mimbres River in New Mexico, the Humbolt River in Nevada and the Mojave River in California.

The Colorado River reaches its highest stage in the month of June during the summer rainy season. The water resulting from melting snow in the mountains and frequent heavy rains, empties into the Colorado River and rushes through the Grand Canyon in a

mighty torrent to the sea. At the time of the freshet, the river invariably overflows its banks near its mouth, and the flood waters cut their way through the land in new channels on the lines of least resistance. After the flood subsides and after the overflowed land becomes sufficiently dried, the Indians plant their corn and melons in the damp soil and raise bountiful crops without any more rain or further effort. Because of the dry climate and the overflow of the Colorado River, it was suggested at various times that its banks be cut and the river turned into the Salton Sink to form an inland sea to improve the climate; but it was never done. However, this very thing happened unintentionally many years later, when the irrigation company tapped the river to fill its canal to moisten the rich soil of this newly discovered agricultural field.

During the summer flow of 1905 the high water broke into the canal in an uncontrollable flood and went racing down the steep grade in a rushing, raging torrent into the Salton Sink, where it soon formed a large lake. As the water gradually spread over the bottom land it first destroyed the salt works established there many years ago, and then submerged the Southern Pacific Railroad track which was built on an air line through the basin from Indio to Yuma. The encroaching waters made it necessary to move the track to higher ground repeatedly in order to escape the rising tide. After a heroic struggle and only by the greatest effort was the break in the river bank closed and the water turned back into its natural channel. Two years later the same thing happened again, but in a new place and on a much larger scale, when the mad, runaway river went racing on once more into the Salton Sink.

The situation was now desperate and even worse than before, and experienced engineers predicted that the river could never be controlled. In the meantime a new danger developed. At the lower end of the self made canal, where the water entered the lake, a cataract had formed that grew into a falls eighty feet high and one thousand feet wide. The receding water-falls kept on steadily cutting back into new soil and traveled up stream at the rate of one third of a mile per day. This cutting back was bound to continue as long as the flood lasted, or until it reached the river; and then on up the stream past Yuma until it reached rock bottom in the great gorge of the Grand Canyon above. This action would not only destroy the Laguna Dam, but also sink the river bed so deep into the earth that the water could not be raised again to fill the canals by gravity flow, and thus destroy its usefulness for irrigation for all time. The financial loss of such a catastrophe was estimated to amount to fully one billion dollars, which made it imperative that the break in the river bank be speedily and permanently closed.

The Southern Pacific Railroad, which had borne the brunt of previously checking the river, lent itself again to the task of closing the gap, and was, indeed, the only adequate available force in sight. Complicated engineering rules were ignored, and preparations rushed to fill the breach by the most direct methods and in the shortest possible time. Human ingenuity was pitted against Nature's forces, and Man won. A double railroad track trestle fifty feet wide was started across the gap for running cars and dumping rocks and other filling material in an uninterrupted stream.

It was no small matter to drive ninety foot piles in thirty feet of swift running water that was heavily

loaded with submerged drift. Often when a pile seemed to be securely anchored it would suddenly be dislodged and shot into the air by the mad swirl of water, or snapped like the stem of a clay pipe under an extra pressure of driftwood. Whole bents of the trestle went out at a time that were immediately replaced by men and material held in reserve for just such an emergency.

Active work went on day and night without cessation and the seemingly impossible feat of closing the gap was finally accomplished on February tenth, 1907. It took nearly two years to close the first break and only two months to do it the second time, although the last job was much the harder, but everything was ready and the men had more experience and were better equipped for the work. It is a striking example of the value of preparedness that applies with equal force to other lines of endeavor.

Notwithstanding that the water in the Salton Sea was once all licked up and evaporated by the dry hot air of the desert, it is not likely that this thing will ever happen again as local conditions have changed. Under irrigation there will always be a small stream of water flowing into the lake, caused by seepage and overflowing ditches, that will render negative the drying effects of evaporation. Recent events denote that the Salton Sea has come back to stay, but as a fresh water lake. Contrary to expectations this large body of water on the desert has produced no perceptible effect on the climate, nor will it in the future. The factors that cause siccitry are cosmic rather than local, and any man made changes in local conditions cannot be expected to change Nature or alter her immutable laws. But the possibility of the Colorado River break-

ing loose again and filling the dry lake permanently with a flood of water will always remain as an ever present menace to the people of the Imperial Valley.

Any community that aspires to become a cosmopolitan city must have an abundance of good water for domestic use and other purposes. Such a favorable situation was the good fortune of Los Angeles when it started on a career of city building. The entire coastal plain is one vast artesian basin where water can be obtained almost anywhere by digging, and if a well does not flow the water is so near the top that it can be easily pumped.

Another source of supply is the Los Angeles River, which is not always reliable, as it is subject to fluctuations. In the winter rainy season there is plenty of water running in the river but during the long dry summer when it is most needed, the stream almost disappears. On the plains of Southern California the streams are all formed on the dyke type. In the mountains much heavy material like gravel and sand is picked up by the water after a rain and is carried downstream by the impetuous current to be deposited below, where it builds up a river bed on made land above the level of the surrounding plain. After every heavy rain or thaw of snow on the highlands the rivers run full and sometimes overflow their low banks, when the liberated flood goes meandering over the landscape to the serious loss and inconvenience of the people. In recent years flood control methods have been adopted which have improved conditions greatly and such destructive floods are no longer feared.

After the conservation of water came into vogue the Los Angeles River lost its imposing look because of its empty appearance, and on that account it is some-

times ridiculed by strangers who are unacquainted with local conditions. In a dry land where the soil is thirsty for rain, water is too precious to be allowed to run to waste, and every drop of surplus water is caught and stored for whatever use it may be most needed. Thus all of the water in the river, which is the property of the city, is appropriated almost before it reaches the city gates and is turned to some good purpose. It is filtered through gravel beds and purified for domestic purposes, and is used in sprinkling the streets, filling the lakes in the numerous pleasure parks about the city, and for irrigating much land that makes possible the miles and miles of beautiful green fields, lawns and flower gardens, which are such attractive features of the country.

The water supply of a growing city is of vital importance, and when it is uncertain the fear of a possible shortage is a constant concern. In such a situation it is only natural to anticipate a time when extra efforts will have to be made to increase the visible supply. This pre-vision of events the Los Angeles officials seem to have had, and instead of waiting for rain to fall from the clouds, started a hunt to find more water to fill new reservoirs. Investigation proved that no other large body of water existed in the vicinity of Los Angeles than those already in use. The search was then extended to new territory in outlying districts, and the nearest source for a new supply was ascertained to be the Owens River, two hundred and fifty miles north on the desert. This river is fed from the watershed of Mount Whitney, which is fifteen thousand feet high and is the highest mountain in California. Immediate steps were taken to secure the necessary land and water rights on that stream, which gives

the city all the water and electric power it needs for all time to come.

The city voted twenty-five million dollars in bonds to build an aqueduct of concrete and steel to carry, by gravity flow, thirty thousand miners' inches of pure mountain water to the gates of the city, which is now the municipal water system. Building this huge aqueduct was a big undertaking, but the plan was fully considered and pronounced feasible by a board of engineering experts before the work was begun. It was to be completed in five years but was finished sooner; and the fact that it cost less than the estimated price proves that there was no waste or graft in its construction.

Few cities are ever called to finance and engineer so large an undertaking, or are willing and able to put it through. The people were practically unanimous in favor of the enterprise, and their customary optimism and unity of action, as in every enterprise for the good of the city, assured its success from the beginning.

CHAPTER XI

SOUTHWEST CLIMATE

THE Southwest has qualities of climate that are not found in any other portion of the United States, nor, perhaps, in the whole world.

Every country has its own local weather conditions and the peculiarities of weather that are found in one section are often the opposite of what exist in some other region. About every kind of climate is found somewhere in the United States, and no citizen of the nation has to leave his own country in search of it. All that is necessary for him to do to find what he wants, is to enquire and ascertain what there is at home.

There is a marked difference in climate between the eastern and western half of the United States. Near the one hundredth meridian of longitude, at the geographic center of our country, the change begins that separates the humid east from the arid west. The humidity in the east is always excessive and causes much physical discomfort that is not experienced in the arid regions of the far west.

The low lying woodlands of the east, and wide prairies of the middle west, have many disagreeable climatic changes and weather extremes. The summers are excessively hot and the winters extremely cold. Not only are there these uncomfortable spells of heat and cold, but there are also frequent storms of thunder

and lightning, accompanied by either wind, rain, hail or snow, which give unpleasant variety to the weather. Humidity accentuates the summer's heat and causes much extra sickness, suffering and death. A moist atmosphere in winter, likewise, intensifies the cold, when the earth lies buried beneath snow and ice and the land is swept by raging blizzards. Local storms may come from any direction but most of the big general storms come out of the northwest, from Medicine Hat and the Puget Sound country. Whenever one of these storms starts on its eastward course, spreading out like an open fan as it goes, it sweeps the entire country from the lakes to the gulf, and from the mountains to the sea.

In the arid Southwest there are never any destructive storms and much of the country is practically free from all weather extremes. The atmosphere is always warm and dry; while the sunshine is hot, the heat is not felt severely as it is tempered by siccitv and is not oppressive. The difference in the effect is due to the lack of moisture. A shade temperature of one hundred and twenty degrees Fahrenheit in arid Yuma is more tolerable and less dangerous to life than are eighty degrees in humid New York.

Evaporation causes coolness but where there is much moisture in the air, evaporation ceases. Whenever the dry and wet bulb thermometers register within a few degrees of each other, as they often do in the east, it means that the humidity is high, the air heavily charged with moisture and evaporation at a standstill. If great heat is added to the dampness, the combination causes much suffering to both man and beast and sunstroke is of frequent occurrence, which often results in death. Evaporation is one of nature's methods

for cooling the body and maintaining its normal temperature. The perspiration on the body evaporates quickly in the dry air and gives a refreshing sense of coolness. In a damp atmosphere the body remains swathed in a blanket of sticky secretion that cannot evaporate and has a depressive effect.

Humidity is an important factor in climatology and is of two kinds, absolute and relative. The former represents the maximum amount of water that the air is capable of absorbing, and the latter is the actual amount of water which is present in the air at any given time and place, and is sometimes called the saturation deficit. Relative humidity acts on a sliding scale of percentages that changes continually and is controlled by temperature. Warm air is capable of absorbing more moisture than cold air; and a dry atmosphere is more favorable to health than a damp climate.

In traveling across the continent the difference in humidity is very perceptible. In the rain belt of the east the perspiration in hot weather is profuse, even when sitting quietly in a rapidly moving car, and is accompanied by a muggy, disagreeable feeling of dampness. After passing into the dry climate of Colorado or New Mexico, and clear on to the Pacific Coast, the feeling of dampness and depression is absent. This quality of atmosphere acts as a primitive refrigerator by evaporation, and is made use of in the west for cooling the drinking water in an olla, and for preserving meat in a dry air refrigerator. These methods of refrigeration by evaporation are quite effective, but inferior to the modern ice plant which is now found in many places on the desert, and adds much to the comfort of living in a hot country.

What is meant by the Southwest depends somewhat on the view point. From any starting point in New York, the larger portion of the United States might be included in the Southwest. Leaving the Atlantic Coast and going west to Chicago, Saint Louis or Kansas City, the southwest area becomes considerably contracted, but is yet an undefined territory. The real Southwest, therefore, is located in the extreme southwest corner of our country, and is bounded on the east by the Continental Divide, on the north by the Colorado Plateau, on the west by the Pacific Ocean and on the south by the Gulf of California, and includes New Mexico, Arizona and Southern California.

The Continental Divide of the Rocky Mountains is the dividing line between the western plains and the Pacific slope. The climate west of the Continental Divide is more uniform and mild than it is elsewhere, and is noticeably sharper east of the Divide in New Mexico than it is over the line in Arizona and California.

From the Continental Divide the land slopes towards the southwest and its rivers all empty into the western sea. The altitude varies from several hundred feet below sea level on the Colorado Desert and in Death Valley in California, where the rainfall is scant and the evaporation excessive, to thirteen thousand feet above on the San Francisco Mountains in Arizona.

A coast country usually has a damp climate, but the delta of the Colorado River and the shores of the Gulf of California are notable exceptions. Notwithstanding that this place is near large bodies of water, the air is as dry as if it were in the heart of a waterless desert. Because of its aridity this region has advantages of climate that a humid country cannot have.

There is very little sickness of any kind and the local conditions are favorable for convalescence and recuperation from wasting diseases.

In changing climate the object should be to find a place where conditions are the opposite of those of the existing environment. The changes that would naturally follow the observance of this rule, would be to go from a damp to a dry climate and from a low to a high altitude, or vice versa. As dampness prevails almost universally, a dry climate must usually be sought, as dryness is needed to counteract the deleterious effects of humidity. It is also desirable, sometimes, to change from a low damp climate to a high dry one, but some patients cannot endure altitude because of the existence of some organic disease which requires atmospheric pressure. In such a case the best thing to do is to live in a dry climate, even if it is near sea level. Such a spot is found in the Yuma country, which has an ideal winter climate. Not everybody who needs a change of climate can get it. Some do not know where to go to better their condition, or if knowing, do not have the means to take them; while others who try, do so in such a haphazard manner that their efforts get them nowhere.

The Yuma climate has been enthusiastically described as "intoxicatingly salubrious." It is a winter summer land of sunny skies and balmy breezes with an atmosphere that is surpassingly pure and dry. J. Ross Browne, the noted author and traveler, crossed the Colorado Desert in the winter of 1863, when the country was new and unspoiled, and writes of his trip as follows: "The climate in winter is indescribably delightful; in summer the heat is excessive and travelers and animals suffer much from the

journey. It was a perfect luxury to breathe such pure soft air in the middle of December, when our Atlantic friends were freezing amid the ice and snow of that wretched part of the world. Between the desert of the Colorado and the City of New York there is no comparison in any respect. Give me a pack mule, a shot gun and a sack of pinole, with such a climate as this and you may take your brick deserts on Fifth Avenue and your hot air furnaces and brain racking excitements and be happy with them! Accept my pity, but leave me, if you please, to chase rabbits and quails where the sun shines and to lie down of nights and sleep on the warm bosom of my mother earth."

The Colorado Desert that is here described has changed its name, but not its climate, and is now known as the Imperial Valley, one of the greatest producing countries under the sun. The change that has taken place is wonderful, and must be seen to be fully appreciated. The atmosphere is as pure as it can be made and every breath inhaled seems to be an inspiration of new life. If air could be bottled up and transported in sufficient quantity, like mineral water, the Yuma climate could be shipped east in carload lots, where its life giving properties would invigorate the sick and send thousands of suffering invalids and health seekers every winter to the waiting banks of the Colorado River.

The interior country of the Southwest is comparatively new and sparsely settled and the air has not yet become contaminated with the impurities that are generated by civilized life; nor is it likely that the country will ever be much different from what it is at the present time, owing to its arid state. The pure air is not confined to any one particular locality, but

is the same everywhere, at sea level as well as upon the mountain top. The air blows in off the ocean in gentle zephyrs and becomes refined in the highest degree by passing through the fiery furnace of the desert. The variety of altitudes which the country offers gives an opportunity to change to any elevation and temperature that may be desired and at the same time have the benefit of the softest, purest winds that blow.

Upon the low lands of the Southwest in the valleys of the Gila and Colorado rivers the summer is hot, but the heat is not enervating or oppressive. Men go about their daily work in the sunshine the same as they do in a cold climate, yet do not suffer from the heat, and sunstroke is almost unknown. However, the long summer hot spell becomes tiresome and to some it may even grow to be monotonous. The people who can leave home either go to the mountains or the seashore to escape it. Those who remain at home, and many stay from choice, as they do not find the heat uncomfortable but often beneficial, by adopting habits that suit the local weather condition, actually manage to keep cool. Strange as it may appear, there is less sickness during the heated term than at any other time of the year, and the doctors invariably shut up shop and take a vacation.

It is just the place for thin blooded people to live who have cold feet, and find it difficult to keep warm without having to hug continually a base burner stove or hot air furnace. It is also an ideal place for the fresh air fiend, who imagines that he has to have the whole universe to breathe in, and wants every window and door in the house thrown wide open to the sky, without regard to the state of the weather or whom

it might inconvenience or injure. But for the average mortal to live in measurable comfort during the mid-summer months, it is necessary for him to adopt the native costume of few clothes and the custom of living out of doors.

After sundown there is a rapid radiation of heat and some cooling of the atmosphere takes place, but the nights are spent more comfortably out of doors than in the house. The dwelling absorbs so much heat during the day, that the entire night is required for it to cool off. Because of the heat the majority of persons sleep out of doors and make their beds either on the flat roof of a house, the floor of a porch, the ground of a dooryard, or on the side of a street, as best suits the pleasure or convenience of the sleeper. It is a curious sight to see a street, that has no fences, in some remote frontier hamlet, lined with beds, and to see the people getting up and making their toilets out of doors in the early hours of the morning, the same as in a regular camp. This style of living may not conform to the established usage of polite society in a civilized community, but the local conditions seem to require it, and under the circumstances everything goes as a matter of course.

The Southwest affords unequaled opportunities for providing agreeable camp life and pleasant outings. It is the nation's natural playground, where tired and invalid folks can go to rest themselves and regain their health and strength. The low lands along the Gila and Colorado Rivers and on the Mojave and Colorado Deserts are not desirable places for holding picnics during the summer time, but are delightful spots for spending a winter vacation. The summer picnic grounds are found upon the high plateaus and moun-

tains where the weather is always cool. The Colorado Plateau and the Mogollon and White Mountains of northern Arizona and New Mexico are particularly interesting, and afford suitable places for camping where there is beautiful scenery, comfortable climate and good hunting and fishing. The air is dry and there is very little rain, dew or dampness to cause discomfort. The constant bright sunshine sometimes becomes trying to weak eyes that squint through half closed lids, but are easily relieved by wearing colored glasses which mellow the light.

Everybody needs a change occasionally, just to get out of the rut of daily routine and to break the monotony of sameness. Any kind of a change is better than none, but a complete change of occupation and environment is necessary to obtain the best results. It is especially important for the city dwellers to make such a change, where life is largely artificial and the nervous tension great. A change to be wholly beneficial does not mean merely to leave home and the crowded city, but also implies keeping away from the main thoroughfares of travel, and getting out into the wilds, far away from the madding crowd and clear out of reach of the daily paper, telephone and telegraph. If any man imagines that he is of so much importance that the world cannot get along without him, just let him try it by going into seclusion, when he will soon discover his own insignificance and find out how little he is missed. When he has found the right place he will come to himself and realize how necessary it is to return again to a natural life. The freedom of an outdoor life, where he is surrounded by the peace and quiet of nature, rests and refreshes the whole man—mind, soul and body—beyond the power of words to

express. The great Southwest is such a playground, where the multitudes can find room to frolic and become rejuvenated.

A camping trip into the wilderness results in the greatest benefit and pleasure when the company is not too large. Two or three congenial companions who are banded together in good fellowship is far better than a promiscuous crowd. Not every one finds pleasure in such a life. Any one who cares only for luxury and ease will not find any joy in camp life. Trifles occur daily to try the patience, and poise is needed not to be easily disturbed. A selfish person never makes a desirable camp mate. Unselfishness and kindness are qualities that help to make loyal comrades and lasting friendships.

The camp outfit should consist of the fewest things possible to insure comfort. A light wagon and good team of horses are necessary for conveyance and are preferable to an automobile on account of the uncertainty of good roads. Likewise a sheet iron camp stove is a great convenience, but not essential. If a folding cot is used it makes a safe bed from possible attacks by small night-prowling varmints. A large piece of canvas upon which to spread the bed, and as a top cover, is indispensable to keep out the wind and rain in stormy weather. In cold dry weather the bed should be made on the ground in sand, leaves or pine needles, as it is more comfortable than a folding cot. A Hopi or Navajo spreads a sheep or goat skin upon the ground for a mattress, and with a saddle blanket as a cover, sleeps soundly and warmly in any kind of weather. A sleeping bag is unnecessary in a hot country. When camp is struck the cot is folded up with the canvas and blankets in a bed roll tied with a rope

or strap, which makes a compact and convenient bundle for handling and stowing away in the wagon.

Grass, wood and water are the three essentials of a good camp ground and are usually found at suitable intervals along the road; but some extra hay and grain must be carried in the wagon for the horses, to use in case of emergency, and the canteen, water bag or barrel of water must not be forgotten for use on the road and at a possible dry camp. The supply of provisions should be ample to meet all requirements, and to satisfy the keen appetites that are sure to materialize during the trip.

The object of such a trip is not to make haste, but to travel leisurely and to stop frequently as the inclination or circumstances may direct. At some convenient spot camp should be made for a longer stay, to rest and enjoy the scenery, or to explore the locality for interesting objects. If riding in the wagon becomes tiresome, a change should be made to horseback or a tramp taken on foot. Any change in the manner of locomotion, or other kind of exercise, gives rest by bringing into action a new set of muscles and prevents the feeling of weariness or exhaustion. All of the vital functions are stimulated and benefited by regulated action and after such a vacation life takes on a new meaning, something entirely different from anything that is ever experienced by the sedentary routine plodder.

CHAPTER XII

SOUTHERN CALIFORNIA

SOUTHERN CALIFORNIA is in the arid region of North America, and has a distinct climate of its own. Its excellence is due to a combination of good qualities, that are found in its unique topography, velo cloud and sea breeze.

The country south of Tehachepi is Southern California, but it is not all alike. It consists of two parts and is divided by the Coast Range of mountains. On the ocean side is the real Southern California, which is so much praised and prized for its balmy, pleasant weather, that lasts throughout the year. Over the mountains on the desert, the land is dry, dreary and desolate as Sahara, with no prospect that the existing conditions will ever change materially. For any one to picture Southern California as it is described on the ocean side and then meet the desert variety, as is usually done by the tourist from the east on his way to the Coast, is, indeed, disappointing.

The peculiar topography of the country is one of three striking features that help to make its delightful climate. All along the northern coast the mountains hug the ocean shore and prevent the seabreeze from blowing far inland, except through the single break of the Golden Gate at San Francisco. On the southern coast the mountains are deflected from the ocean at Point Conception and turn abruptly eastward, after

which they are named by sections as the Sierra Madre, San Bernardino and San Jacinto Mountains. These high mountains stand as a protecting wall to prevent the incursion of disagreeable and destructive storms from the desert.

The littoral of Southern California is shaped like a crescent, with its two horns touching the ocean at Santa Barbara and San Diego. Its concave shore line is two hundred and fifty miles long; but its convex base line is considerably longer, as it curves inland to a depth of one hundred miles at its widest part at San Bernardino. Over this broad coastal plain the refreshing sea breeze blows daily during the summer unobstructed.

A second feature that helps to make the distinctive climate of Southern California is the *velo* cloud. It is a high fog, or thin vapor cloud, with a smooth unruffled under surface, that has the appearance of rain. It forms in a still atmosphere above the water, and floats in slowly from the ocean over the land during the night, until in the morning it covers the sky completely from the mountains to the sea. The *velo* cloud never brings rain, although it is frequently mistaken for a rain cloud by the uninitiated. The eastern tourist who is, perhaps, only familiar with his home brand of weather, and to whom almost any kind of a cloud means rain, if he is a summer visitor and sees the morning sky covered by an unbroken cloud, naturally imagines that it is going to rain. If he starts out to take a walk, he sallies forth with an umbrella as if he were at home, which is the badge of a tenderfoot and certain to attract attention. The appearance of an umbrella in the street on a cloudy summer morning proclaims its owner to be a stranger in California.

From the look of the clouds he expects rain, which is the one thing that he does not want, as he came seeking pleasant weather and a good time, and is surprised when he finds that it does not rain. During the entire summer this form of cloud comes and goes in the sky almost daily, but without giving any rain. The cloud disappears in the course of the forenoon and in the afternoon the sky is perfectly clear.

During the presence of the *velo* cloud, which hangs motionless in the sky, there is absolute calm until the seabreeze begins to blow, when the cloud dissolves and vanishes as if by magic. The cloud is a regular feature of the normal summer weather and when it is missing its absence is quickly noticed and felt. If the morning cloud canopies the sky it is a sure indication that there will be the usual seabreeze and a comfortable day. The "pillar of cloud" shields the land from the hot rays of the morning sun when there is no breeze, and after the wind begins to blow there is no need of a cloud, as the seabreeze neutralizes the heat of the sun and even makes the sunshine seem cool. When there is no morning cloud the day will be hot and the temperature above the average. Whenever such a day occurs, and it happens rarely, it is invariably followed by two or three hot days in succession, before the weather changes back again to normal.

A third attractive feature of the climate is the daily seabreeze. The cool breeze of salt air blowing off of the ocean on a hot summer's day feels deliciously refreshing and invigorating.

The trade winds blow with great regularity during the summer months, when they are most needed, the seabreeze by day and the land breeze at night. The seabreeze always has about the same temperature,

which by contrast with the outside weather, feels cool in summer and warm in winter. It is tempered by the great Kuro Shiwo, or Japan Current, in the Pacific Ocean, that sweeps down the coast in a broad deep stream. At Point Conception where the shore curves to the east and the Channel Islands begin, the current leaves the shore and flows straight out to sea, making the seabreeze feel like the cool breath from a snow bank. The Kuro Shiwo regulates the temperature of the water in the Pacific Ocean so that on the Pacific Coast it never varies more than eight degrees Fahrenheit during the year, while the difference in temperature of the water on the Atlantic Coast amounts to forty degrees during the same time.

The cold, heavy seabreeze on the coast does not rise far above the land, or cross the high mountains. Having its progress barred in the direction of the land by the Coast Range, it sweeps southward along the shore until it reaches the open country of Southern California, where it spreads out in a gentle zephyr over the wide Los Angeles plain. This wind travels at the rate of six miles an hour and never acquires uncomfortable force or velocity.

The one factor more than any other that contributes to this favorable combination of climate, is the close proximity of the ocean to the desert. Over the mountains upon the desert and far away from any water, the summer heat becomes intense. Hot air expands and ascends while cold air is heavy and sinks. When the hot desert air rises it creates a vacuum that must be filled. This can only be done by cold air rushing in from the outside, which in this case happens to be the seabreeze.

After the ascending hot air from the desert reaches

a point about one mile in height, it starts a current that carries it over the mountains on to the Pacific Ocean, where it becomes cool and returns again to the land as the refreshing seabreeze. During the period of greatest heat on the desert, the seabreeze blows strongest and subsides when the sun goes down and radiation of heat begins. On its return journey to the desert the seabreeze gradually loses its coolness and changes back to desert air. The breeze which was blowing all the afternoon dies down to a calm at sunset. After a brief period of rest it begins again, but now blows from the opposite direction and becomes the land breeze that lasts through the night. The soft summer morning cloud and calm, and the clear afternoon sky and cool seabreeze, make a combination of climate that could not be improved if made to order.

The period of the velo cloud and seabreeze lasts during one half of the year, beginning in the spring at about the time of the vernal equinox and disappearing in the fall with the advent of the autumnal equinox. The cloud and breeze come at a time when they are most useful during the hot summer months and disappear with the return of the cool autumn days, when they are no longer needed.

Upon the high plateau region between the Sierra Nevada and Rocky Mountains, there are two rainy seasons during the year, that are known as the summer and winter rains. On their western slope from the Sierras to the sea there is only one rainy season, which is during the winter.

The rainfall on the Pacific Coast is peculiar. The rain invariably falls gently and is seldom accompanied by wind or thunder and lightning. The atmosphere is remarkably free from electricity and rarely produces

any unpleasant effects. During the summer rainy season upon the desert, a dark nimbus rain cloud is sometimes seen above the mountain crest, but it rarely ever crosses over. The land is at all times free from destructive storms and is perfectly safe for timid people who are frightened by them. The duration of the rainy season and the amount of precipitation varies greatly in different sections of the coast. In the south the season is short and the rainfall light, while in the north it rains during most of the year.

The average annual rainfall is approximately ten inches at San Diego, fifteen inches at Los Angeles, thirty inches at San Francisco, eighty inches in Oregon, one hundred inches in Washington and as high as one hundred and thirty in Alaska. The rains are heavier in the mountains than on the plains. To say that it never rains in summer in Southern California, or that there is no thunder and lightning, is only stating a general truth that has some exceptions. These things do sometimes occur but are so rare that when they do happen they are a seven days' wonder and cause much comment. Ordinarily when there is any thunder and lightning, it is liable to be during the opening and closing storms of the rainy season.

The rainy season in Southern California is not a continuous downpour, as the name might imply, but is only a term that is used to distinguish it from the dry season. The first shower may come at any time during the month of October or November, but it rarely begins in earnest until December or January. A gentle, almost imperceptible breeze, in a hazy atmosphere, blows steadily for several days from the south or southeast, during which time the storm gathers and the rain begins to fall. It is not a storm in the usual

meaning of that term, which implies noise and commotion, but the rain falls gently, is unattended by wind and unaccompanied by any sound save the quiet tinkle of the rain drops as they patter on the roof, or fall upon the leaves of the trees and the grassy mold. The sound of the first raindrops of the season is the sweetest music that ever falls upon a Californian's ear and is always welcome.

The rainfall is sometimes excessive, but more often it is deficient. As much as rain may be needed, it is not desired in the summer, as it would spoil the climate and with the precious climate gone, there would be very little left, in an important sense, that a Californian would care to live for. As numerous and rich as are the varied resources of the state, it is not only freely admitted, but enthusiastically conceded, that the climate is its chief asset and the compelling force that draws crowds of people the year round.

The rain invariably comes in on a south wind, but strange to say, it begins to fall in the north and travels down the coast. Before Los Angeles can expect any rain it must rain first in San Francisco, five hundred miles away, and not until after twenty-four hours does it arrive in Southern California. Sometimes a rain that starts up north does not extend farther south than Tehachepi, which is a disappointment, for then the rain that is needed does not arrive. The rainy season starts earlier and lasts longer in the north than it does in the south.

After one or more weeks of pleasant weather another rain comes, much like the first, but this time with a decided snowfall in the mountains and the temperature acquires some winter coolness. The ample rains wash the sky clean of smoke and dust and a new crea-

tion is begun. After a long rainless summer, the brown fields again begin to look green and soon the entire landscape is clothed with a carpet of richest verdure. The annual vegetation of California has an unusual, vivid shade of green, that is both striking and pleasing. By this time the atmosphere begins to show the limpid transparency for which the winters of Southern California have become noted. Mountains that are fifty miles away appear to be distant only a morning's walk.

About the middle of December may be expected the first general rain. After the usual preliminaries the rain begins to fall and continues interruptedly for a week or ten days. The rain is marked by showers that fall during the afternoon and night, the mornings being only cloudy without much rain. Deep snow piles up in the mountains while the rain falls in the valleys below, which makes a beautiful contrast of green valleys, white mountains and blue skies.

January is usually a month of clear skies and bright sunshine, that to many persons is the most pleasant time of the year. Any change in the weather is moderate and mild, and never extreme or destructive. There are no cyclones or blizzards to fear or worry about. As has been pertinently stated: "Everything in California is love and sunshine, and life is one long sweet dream." This saying may not be strictly true, but it must have some basis of fact, or it would never have been originated. A cold winter, which is a bugbear to most people, is unknown. The fact that there is never any severe frost is evidenced by the constant green color of growing vegetation which is seen in garden, field and orchard and lasts throughout the year.

A good climate, like health and wealth, is not always appreciated until after it is lost, when it is too late for regrets. Rain the country needs and must have, to furnish a supply of water and this is exclusively provided during the winter. Rain and mud make temporarily unpleasant weather for getting about and sightseeing, so that the tourist who wants to be absolutely sure of good weather, should see California in summer when the pleasant weather never fails. The many good roads in and about Los Angeles make travel easy and automobiling a delight. Upon the broad paved boulevards automobiles whiz by in a continuous flight, strung out like a flock of wild pigeons going home in the good old days of long ago. Where they all come from or where they are going nobody knows, and it would be hard to guess.

The mirage occurs in all arid countries and is often seen in Southern California. However, as the land is mostly fenced and cultivated, the open spaces where the mirage loves to play are more limited than on the desert. Whenever one appears in an orchard, the small fruit trees seem to stand in the water on stilts and are magnified into tall forest trees.

The mirage is affected by changes in distance, elevation and the angle of vision. When seen upon a highway it has the appearance of being suspended in mid air, and moving vehicles go gliding over the water like boats floating on wheels. The apparition sometimes comes to town and can be seen on the streets in many places. Figueroa Street in Los Angeles is one of its favorite resorts, where a mirage may be seen at almost any hour of the day. The street runs north and south through the city and is much used for automobiling, but is only one of many fine avenues for driving.

The mirage changes its position frequently, but never permits of any near approach. It vanishes from one spot only to reappear in some other place. Sometimes it seems to be very near and again it is far away. Even when it is in plain sight, its exact spot is as difficult to locate as the end of a rainbow. Chase it as fast as you please, it cannot be caught, as it travels just as fast as you do and always keeps some distance ahead. The street looks like a lake, and all objects in front and on its sides are reflected in the magic water as in a mirror. A heedless person passing on the road is not apt to notice it unless it is pointed out. When that part of the road is reached where the lake seemed to be, there is not a drop of water in sight, and the pavement is perfectly dry. It is an interesting object to behold and an attractive subject for study.

The weather is rarely uncomfortably hot and then only for a short time in the sunshine during the middle of the day. The climate is, indeed, more cold than hot and the evenings are too cool to sit in comfort in the open air out of doors without an extra wrap; and a little fire in the house feels good almost any day in the year. In the early days when the people lived the simple life, no indoor fires were ever used, and the houses were built without chimneys. But times have changed and now every house is provided with some means of heating. A little fire in a small stove or grate removes the chill in cool weather, and only the large building ever needs a furnace.

There are many small one story houses built that have no stairs, which plan has its advantage, but during hot weather a two-story house is more comfortable. When the hot sun beats directly upon the roof and sides of a one-story house every room in the building

soon becomes uncomfortably hot. In a two-story house the upstairs rooms become heated in like manner, but the rooms on the ground floor, and especially those on the north side of the house, are always cool, as the heat never lasts long enough to penetrate into the interior. There is never enough of either heat or cold to cause much discomfort, and they need not be considered as serious factors of life.

Speaking of hot things suggests the growing and using of chilli, or red pepper, as a seasoning for food in Spanish cooking which deserves to be mentioned. Mexican spices are too hot to suit the eastern palate, but a taste for pepper is soon acquired by a little practice. Almost every dish in the menu is highly seasoned with chilli, which gives it an unusual relish. This viand is well adapted to the climate and helps to counteract the chilly sensation that is sometimes felt. A little red pepper is both wholesome and palatable as it stimulates the circulation and aids digestion and assimilation. The tasty Spanish dishes of tamales, frijoles, enchiladas, chilli con carne, etc., are enough to tempt the palate of an epicure.

That the comfortable climate is favorable to longevity cannot be doubted. It may not prolong life indefinitely as some ardent enthusiasts profess to believe, but it does seem to prolong the average allotment of life. It is a fact that more old people live in Southern California in proportion to the population than in any other land under the sun. They have come here to spend their declining years in peace and comfort. White hairs are seen everywhere upon the streets, in churches and wherever people are wont to gather. The mortuary tables also show that a large majority of deaths are of persons who have passed the meridian

of life and very seldom is the death of a child or young person recorded.

A favorite illustration is often used that compares man's progress in life to the growth of the sturdy oak tree. As a tree is supposed to be made more rugged and staunch by buffeting winds and a rigorous climate, even so is man supposed to be benefited by similar rough treatment. But in California this simile does not seem to fit. Here, as elsewhere, is found the noble oak tree, but far above and beyond the oak towers the giant redwood, by the side of which the largest oak is only a pygmy and puny affair. The redwood monarch of the forest does not get rough treatment, but acquires its mammoth proportions in a mild climate, and is the oldest living thing in the world. Out of five hundred giant trees in the Mariposa Grove of redwoods, the Grizzly Giant, which is the largest tree of the group, has been scientifically labeled as being eight thousand years old. A dash of winter and touch of rigorous climate may sometimes be beneficial to both men and trees, but is not really necessary as is proven by the records of California.

Bayard Taylor's dream that a more beautiful race of people would possess this Paradise seems to have been prophetic, and has already come to pass. When he returned to California in 1859, ten years after his first visit, he wrote that "the children are certainly a great improvement upon those born among us," and describes them as "strong limbed, red blooded and graceful." He also seems to have realized that the climate was not only good for the young, but was equally well suited to the aged and infirm, when he declares that "If I live to be old and feel my faculties failing, I shall go back to restore the sensations of youth in that wonderful air."

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